COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

THE DETERMINATIONS WITH RESPECT TO THE RATEMAKING STANDARDS IDENTIFIED IN SECTION 111(d)(1)-(6) OF THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978	)	ADMINISTRATIVE CASE NO. 203 (a) Kentucky Utilities Company (b) Louisville Gas and Electric Company (c) Union Light, Heat and Power Company (d) Kentucky Power Company

O R D E R

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INTRODUCTION

The federal Public Utility Regulatory Policies Act of 1978 ("PURPA") -- the "lawyers and consultants relief act" 1/ -- requires state commissions to consider certain regulatory and ratemaking standards. When the Kentucky Public Service Commission (Commission") came into being on March 1, 1981, it found efforts designed to satisfy PURPA well underway. In 1979 the predecessor Energy Regulatory Commission ("ERC") had created a research unit within the staff, and had made the PURPA requirements the principal assignment of the research unit. Moreover, in May of 1980 Dr. Virgil Christian, professor of economics at the University of Kentucky, took leave and assumed the position of director of research at the Commission, to oversee the PURPA-related efforts of the staff. Also in the spring of 1980, the ERC

1/ We are indebted to Grant Bruton for this felicitous phrase.

retained the services of Price Waterhouse & Co. for assistance in discharging the Commission's obligations under PURPA.

This Order is limited to the Comission's obligations set forth in section 111 of PURPA. In an effort to satisfy those obligations -- which the Commission has taken very seriously, and has considered neither a burden nor a federal infringement of its prerogatives -- the Commission held 14 hearings over a period of 24 months. When stacked, the materials -- testimony, briefs, transcripts and other written comments -- developed or submitted in this case reach nearly two feet, and the transcripts of hearings total 2284 pages. Indeed, the section 111-related proceedings probably represent the most concerted effort directed at a single issue undertaken by the Commission since its inception in 1934. As well it should. The importance of the issues warrants such a level of effort.

PURPA should not have been necessary. It was. Although there is general agreement that the nature of the electric industry has changed fundamentally over the past decade or so, the responses of the principal actors -- regulatory agencies and utilities -- have been uneven. PURPA is the reaction at the federal level to the uneven responses on the part of the major actors. PURPA is a clear notice to those actors that there is a compelling national

interest in their responses to the new reality. This Commission recognizes that compelling national interest.

BACKGROUND

This Commission has used Administrative Case No. 203 as the vehicle to meet its responsibilities under Section 111 of PURPA. The first Order in this case was issued on March 20, 1979. In that Order the ERC decided "every electric utility under the jurisdiction of the Commission should investigate the feasibility" of the rate design standards as identified in Section 111 of PURPA. Accordingly, each utility was required to submit its plans for studying the feasibility of implementation. Hearings on those plans were held in the fall of 1979. Parties to this proceeding were the four investor-owned electric utilities in the state, Kentucky Utilities ("KU"), Louisville Gas and Electric ("LG&E"), Union Light, Heat and Power ("ULH&P"), and Kentucky Power ("Ky. Power"); the two generating and transmitting cooperatives, Big Rivers and East Kentucky Power; and Berea Electric. Twenty-two of the distribution cooperatives were represented by the two generating and transmitting utilities.

The next Order in this case was issued on February 8, 1980, and limited the coverage to those companies to which PURPA applies. Big Rivers, East Kentucky Power, and Berea Electric were excused from the proceedings because they did

not meet the minimum coverage requirement of annual retail sales of 500 million kilowatt hours. The Order also excused Henderson-Union Rural Electric Cooperative Corporation ("RECC") and Green River RECC from the proceedings. Although those utilities met the PURPA coverage standard, the ERC believed that, in view of the unique characteristics of their loads, subjecting them to the PURPA requirements would result in considerable costs with minimal potential benefits.

On December 15, 1980, the ERC issued its Order for the consideration of the cost of service standard of Section 111(d)(1) of PURPA. The ERC believed -- as does this Commission -- that this was the key standard and should be considered separately from the other ratemaking standards. In addition, that Order expanded the purposes the ERC would consider beyond those of conservation, efficiency, and equity, set forth in PURPA, and added rate continuity, revenue stability, and rate understandability. The Order also provided rules for the discovery of information, as well as a list of issues the companies were to address in their prefiled testimony.

A pre-hearing conference was held January 26, 1981, and in response to comments made at that conference the ERC issued an Order on February 2, 1981, to clarify its rules for discovery of information.

A separate hearing on the cost of service standard was held for each of the four covered companies. The first hearing was conducted on April 27, 1981. The parties to that proceeding were KU, Commission staff, the Attorney General's Office-Division of Consumer Intervention ("Attorney General"), and Black River Lime Company ("Black River"). The second hearing was on April 29, 1981. The parties were LG&E, Commission staff, the Attorney General, and Airco, Inc. The third hearing was on May 4, 1981. The parties were ULH&P, Commission staff, the Attorney General, the Office of the City Solicitor of Covington ("Covington"), and Low Income Residents of Northern Kentucky ("LIRNK"). The final cost of service hearing was on May 6, 1981. The parties were Ky. Power, Commission staff, the Attorney General, the Appalachian Research and Defense Fund of Kentucky, Inc. ("APPALRED"), and Armco Steel Company ("Armco"). Briefs in the cost of service standard were filed with the Commission by July 20, 1981.

On May 19, 1981, the Commission issued an Order which covered the remaining five ratemaking standards in Section 111(d)(2)-(6) of PURPA. The Order described the standards, restated the Commission's purposes, and listed the schedule and issues to be addressed by the covered utilities in their prefiled testimonies. The parties to those proceedings were the same as to the cost of service proceedings, with the

addition of Ashland Oil, Inc. ("Ashland Oil") to both the Ky. Power and LG&E hearings, and Newport Steel Corporation ("Newport Steel") to the ULH&P hearing. Also, a group of industrial intervenors identified as Kentucky Industrial Utility Consumers ("KIUC") was party to the ULH&P, Ky. Power, and KU proceedings. The hearings were conducted on September 1 for ULH&P, September 8 for Ky. Power, September 15 for KU, and September 22, 1981, for LG&E.

On September 9, 1981, the Commission issued an Order which described the process the Commission would be using in lieu of briefs for reaching its final determinations of the Section 111 ratemaking standards of PURPA.

The Commission notes the cooperation of the parties to the proceedings in Administrative Case No. 203. The Commission believes that the efforts expended to develop the substantial record in this case have resulted in increased awareness by all parties of the significance of rate design, and beyond that of the importance of the objectives of PURPA.

PURPOSES OR OBJECTIVES

In its Order establishing Administrative Case 203, the ERC set forth the purposes or objectives which would form the basis of its PURPA considerations. The ERC did not establish priority among those purposes, and while this Commission believes that in general each purpose should have equal weight in its deliberations, it recognizes that at

times objectives will conflict, requiring very careful and explicit choice between or among those objectives which are in conflict. The Conference Report on PURPA provides guidance on both the determination and implementation procedure for the six ratemaking standards. It is not necessary that in every instance all of the purposes be achieved. It is sufficient if any objective is achieved and none is adversely affected. If the Commission determines not to implement a rate standard which has been determined appropriate for carrying out the PURPA purposes, it must include a statement detailing the reasons for such determination.

CONSERVATION

This purpose focuses on the final consumers of electric power. It is intended to minimize the "wasteful" consumption of electricity and to prevent consumption of scarce resources which would be more valuable in some alternative productive use. Prices which reflect the cost of the resources necessary to produce an additional unit of electricity will encourage conservation.

UTILITY EFFICIENCY

This purpose seeks to minimize the total resource cost associated with the production of electricity in the quantity and at the times when consumers want it. The Commission interprets this purpose to have both short run and long run connotations. The short run is a period in which companies

will minimize their costs of production with the existing plant. The long run is a period in which the company can exploit the least-cost approach to electricity production, which includes the utilization of alternative generating technologies and other technologies in meeting its electric load.

EQUITABLE RATES

This purpose envisions the promotion of equitable rates for consumers of electricity. The Commission believes that rates based on costs will achieve this purpose, and that payment for the cost consequences of consumption decisions avoids wasteful subsidies among consumers. However, this purpose is not to be construed as requiring equal rates of return among classes of consumers.

OTHER COMMISSION OBJECTIVES

The Commission realizes that there are important ratemaking objectives in addition to those set forth in PURPA, and although the Commission agrees with the PURPA objectives of conservation, efficiency, and equity, it believes that additional ratemaking objectives should be given consideration. In its Order of December 15, 1980, in this Case the ERC enumerated the PURPA objectives and added the following purposes: (1) To minimize the impact of economic dislocation due to changing rate structures; (2) To promote a rate structure which will assist the utility in its continued

ability to earn a capital-attracting rate of return as well as to provide revenue stability from year-to-year; and (3) To determine rates which are simple, understandable, acceptable to the public, feasible to apply, and free of controversy as to their proper interpretation. More succinctly these objectives are often referred to as rate continuity, revenue stability, and understandability.

The Commission's expanded objectives are similar to those included in the classic work of Professor Bonbright. In that work he stated that "while the ultimate purpose of rate theory is that of suggesting feasible measures of reasonable rates and rate relationships, an intelligent choice of these measures depends primarily on the accepted objectives of rate-making policy and secondarily on the need to minimize undesirable side effects of rates otherwise best designed to attain these objectives." 2/ In order to make such an "intelligent choice," the Commission has expanded its objectives to include those added by the ERC, and has done so primarily in an attempt to minimize any undesirable side effects in its final determinations.

COST OF SERVICE

Section 111 of PURPA establishes the following federal cost of service standard:

2/ James C. Bonbright, PRINCIPLES OF PUBLIC UTILITY RATES (New York: Columbia University Presss, 1961).

> Rates charged by any electric utility for providing electric service to each class of electric consumers shall be designed, to the maximum extent practicable, to reflect the costs of providing electric service to such class, as determined under Section 115(a).

Section 115(a), in turn, provides that:

> In undertaking the consideration and making the determination under Section 111. . .the costs of providing electric service to each class of electric consumers shall, to the maximum extent practicable, be determined on the basis of methods prescribed by the state regulatory authority. . . . Such methods shall to the maximum extent practicable - (1) permit identification of differences in cost incurrence, for each such class of electric consumers, attributable to daily and seasonal time of use of service and (2) permit identification of differences in cost-incurrence attributable to differences in customer demand, and energy components of cost. In prescribing such methods, such state regulatory authority or nonregulated electric utility shall take into account the extent to which total costs to an electric utility are likely to change if - (a) additional capacity is added to meet peak demand relative to base demand; and (b) additional kilowatt-hours of electric energy are delivered to electric consumers.

Section 111(b) of PURPA sets out the procedural requirements for consideration and determination of the standard. Basically, Section 111(b) says that the state regulatory authority must make its determination in writing after evidentiary hearings participated in by electric utilities, intervenors, and the public. Such hearings have been held in Kentucky, and a record of the views of the various parties has been established.

In its regulations under section 133 of PURPA, the Federal Encergy Regulatory Commission required each covered

electric utility to prepare two cost of service studies. The embedded cost of service study would be based on accounting data. The marginal cost of service study would reflect the additional cost to add one more kw of capacity and one more kwh of energy. These studies were part of the record in this proceeding.

A brief summary of the positions of the four participating electric utilities follows. A more extensive treatment of the positions of the utilities, intervenors, and the public is attached as an Appendix.

(a) Kentucky Utilities

KU selected a probability of dispatch ("POD") methodology for its embedded cost of service study. This methodology accurately reflected the KU system operation in that it resulted in a substantial assignment of the cost of expensive base load units to off-peak periods, as well as to peak periods. Not surprisingly, the Company marginal cost study followed the same scheme of allocating capacity cost among rating periods as did the embedded cost study. The significant difference in the marginal cost study was the use of costs of additions to capacity, rather than historical costs of capacity. The Commission believes the use of costs associated with additions to capacity allows a meaningful analysis, and will be essential in determining rates which meet Commission objectives.

(b) Louisville Gas and Electric Company

1. Embedded Cost of Service

LG&E secured the consulting services of Ebasco Business Consulting Company to perform its embedded cost of service study. The study provided was a time-differentiated study which used the base-intermediate-peak ("BIP") method. LG&E witness Hart commented that LG&E chose this method because "I was impressed with it. I think that it is appropriate for our system." 3/

2. Marginal Cost of Service

Ebasco also performed the marginal cost study for LG&E. The study determined long-run marginal cost by using a perturbation technique as required in the Cicchetti, Gillen and Smolensky method. The Trimble County 2 plant, which is a baseload coal plant, was the basis for determining marginal cost. A probability of deficiency program was used to assign marginal cost, both capacity and energy, to each hour. LG&E witness on marginal cost Baron noted that the study was done primarily to meet LG&E's Section 133 PURPA requirement.

3. Embedded Versus Marginal

LG&E witness Hart testified: "It is our recommendation that this Commission reject marginal cost-based pricing

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3/ Transcript of Evidence ("T.E."), April 29, 1981, Vol. 1, p. 13.

because of the major problems of definition, determination, and implementation." 4/ In addition he felt that rates based on embedded cost had a "better chance of accomplishing the purposes than if they are based on marginal costs." 5/

(c) Union Light, Heat and Power

1. Load Research

The Commission commends ULH&P for the substantial progress which it and its parent company, Cincinnati Gas and Electric Company ("CG&E"), have made in their load research program, which was initiated in 1975. Witness Van Curen provided a list of the load research projects completed by CG&E and ULH&P. ULH&P has completed its research for the relevant customer classes as defined in rules implementing section 133 of PURPA. ULH&P used the load data developed on a consolidated system basis by CG&E and did not use borrowed load data for developing the allocation factors used in its cost of service studies.

2. Embedded Cost of Service

The Commission is pleased to note that ULH&P favored adoption of the cost of service standard, as did the other parties to proceeding 203(c). ULH&P favored adoption because it believed it would advance the three purposes of

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4/ Hart testimony, p. 3.

5/ Hart testimony, p. 16.

PURPA and the Commission's additional purposes. Mr. Marshall of ULH&P stated in his direct testimony:

> ...I believe the purposes of PURPA will be served. Rising costs, whether they be attributed to incremental increases in the fuel adjustment or periodic increases in the base charges, convey to the customer a price signal. That price signal encourages the customer to consume less energy not only in the rate of consumption but also in the decision making process in the consumer's selection of a durable good. 6/

3. Marginal Cost of Service

ULH&P filed the CG&E marginal cost of service study. ULH&P's witness, Dr. Chitkara, used the Cicchetti, Gillen and Smolensky methodology for determining marginal cost.

ULH&P used the same method for determining rating periods for the marginal cost study as for the embedded cost study. The periods differed slightly in that the embedded on-peak period was from 8 a.m. to 10 p.m. weekdays while the marginal on-peak was from 8 a.m. to 11 p.m. weekdays. Witness Chitkara explained the differences by stating: "I think 8 a.m. to 11 a.m. on weekdays for the entire year was selected for the Cicchetti methodology earlier than his selection of 8 a.m. to 10 p.m." 7/

ULH&P used the standard Cicchetti procedure of moving plants on the planning horizon either forward or backward

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6/ Marshall testimony, p. 5.

7/ T.E., May 4, 1981, Vol. 4, p. 81.

by one year. ULH&P chose to move four plants forward by one year to determine marginal capacity cost.

4. Embedded Versus Marginal

ULH&P and other witnesses favored embedded over marginal cost of service studies. ULH&P's witness Marshall alleged that there were a number of potential weaknesses in the marginal cost of service methodologies and cited advantages of embedded costs. Mr. Marshall stated:

> The use of embedded costs on a fully allocated basis is more advantageous than marginal costs for several major reasons. First, the test year concept of matching expenses and revenue requirements remain intact. Second, the time frame upon which embedded costs are determined is well defined eliminating the need for arbitrary guesswork. Third, embedded costs recognize the influence of existing costs; i.e., the date certain existence of plant in service and related expenses are more appropriate in the level of cost determination. Fourth, the embedded cost methodology permits the determination of revenue requirements without further arbitrary adjustments needed to scale down to the authorized statutory level. 8/

(d) Kentucky Power Company

1. Embedded Cost of Service

Ky. Power provided its cost of service studies and testimony through its parent company, American Electric Power Company, Inc. ("AEP"). The embedded cost of service study was not a time-differentiated study. Ky. Power witness Jahn stated: "[T]he company, at this point, is

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8/ Marshall testimony, p. 7.

evaluating different means of deriving a time-differentiated study in which we allocate the different time periods." 9/

2. Marginal Cost of Service

Ky. Power estimated the "long-run incremental cost of new generating units to be added to the AEP system during the period 1980-1989." 10/ The marginal energy costs were "estimated for each of the years during the period 1980-1984 using the PROMOD production simulation model. . . . PROMOD simulates the future operations of a utility generation system by giving probabilistic treatment to the impact of random forced outages in the calculation of marginal energy costs." 11/ According to witness Jahn, PROMOD was chosen because it "utilizes the actual planning process used." 12/

3. Embedded Versus Marginal

Ky. Power witness Jahn argued in favor of using embedded or accounting cost for rate design. He believed the "jurisdictional revenue requirements can be allocated accurately to customer classes." 13/ Embedded cost studies used "readily available and fully verifiable costs" 14/ while marginal

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9/ T.E., May 6, 1981, Vol. 1, p. 108.

10/ Jahn testimony, p. 35.

11/ Jahn testimony, p. 38.

12/ Jahn testimony, p. 42.

13/ Jahn testimony, p. 49.

14/ Jahn testimony, p. 49.

costs are sensitive to the method chosen. "Average embedded costs are stable over time and . . . marginal costs are subject to wide variations." 15/ The embedded study "interrelates the elements of the cost of service study including costs, customer class load and size characteristics, and system load and operating characteristics." 16/ Rates based on embedded cost "best reflect current financial responsibilities of the Company." 17/ Also, "the fully allocated accounting or embedded cost of service study is based on straightforward, easily understood principles, thus providing a sound, manageable and coherent basis for the design of rates." 18/ Mr. Jahn further stated that "I do not reject the validity of marginal cost pricing as an abstract theory of economics. What I do reject is the concept of partial marginal cost rates" 19/ that result when one reconciles the revenue generated under pure marginal cost pricing with the class revenue requirements determined from embedded costs.

(e) Determination

One of the least disputed propositions advanced during

15/ Jahn testimony, p. 50.

16/ Jahn testimony, p. 50.

17/ Jahn testimony, p. 50.

18/ Jahn testimony, p. 50.

19/ Jahn testimony, p. 42.

the cost of service hearings was that the conservation, efficiency, and equity purposes of PURPA, as well as the additional objectives of the Commission -- adequacy and stability of revenue for the utilities, minimization of economic dislocations from rate changes, acceptance and understanding of rate structures by consumers -- are best served by rates that track costs. Though there was some concern exhibited about economic dislocation for customers and revenue stability for the company that might arise from any change in its rate structure, (whether that structure is cost-based or not), the preponderance of opinion from companies, intervenors, staff, and the public was that cost of service studies provide a logical starting point for designing rates. The Commission has determined that it is appropriate to implement the cost of service standard. There must be some basis for rates, and the Commission believes that costs have a stronger claim to this role than does any other basis.

Unfortunately, implementing the standard does not resolve all the issues associated with cost of service. As shown by the Appendix of the positions advanced by the various parties in the evidentiary hearings, there was much less agreement on the methodology which best allocates costs among customer classes and results in the best price signals. For that reason, the Commission will not specify a methodology for either embedded or marginal cost studies, but asks that the

studies be logically consistent and reproducible, in the sense that any interested party with some understanding of cost allocation techniques could work his/her way through the numbers. The studies should start with basic accounting and financial costs and system planning data so that the Commission or others may utilize the same costs and data to prepare studies using different allocation schemes, should they desire to do so. Moreover, the models used should be available so that alternative assumptions and allocations could be examined. Finally, the Commission expects that those companies which currently must turn to consultants to perform such studies will start at once to acquire the necessary staff capability.

It is the Commission's opinion that both embedded and marginal cost studies provide information useful to regulatory proceedings. Embedded costs, because they are actual or book costs, provide continuity, stability and equity to the ratemaking process. The Commission believes that this is the proper basis for determining both overall revenue requirements and class revenue requirements. It is for these reasons that the Commission will require an embedded cost study for the test year in future rate cases, beginning with the first rate case of each company filed after the date of this Order.

Marginal costs are based on a forward-looking costing methodology. In an era of inflation, relatively high energy costs, and rapidly changing electric demand, the Commission believes that marginal costs are essential in designing electric rates that will assist it in achieving its conservation and efficiency purposes. It is for this reason that the Commission will require a marginal cost of service study in the second rate case of each company filed after the date of this Order, and thereafter as ordered by the Commission. The study may make use of any standard methodology.

DECLINING BLOCK RATES

Section 111(d)(2) of PURPA states:

> The energy component of a rate, or the amount attributable to the energy component in a rate, charged by any electric utility for providing electric service during any period to any class of electric consumers may not decrease as kilowatt-hour consumption by such class increases during such period except to the extent that such utility demonstrates that the costs to such utility of providing electric service to such class which costs are attributable to such energy component decrease as such consumption increases during such period.

(a) Kentucky Utilities

KU does not favor the adoption of the declining block rate standard. According to KU witness Willhite:

> Adoption is not necessary because the Company's current rate structure as demonstrated by my testimony contains a flat energy component and fuel clause provision which is also flat. The

> adoption of a standard without resultant implementation would unnecessarily complicate rate proceedings and impose unjustified additional costs on the Company's customers. 20/

Despite its assertion that the customer is already paying a flat energy charge, KU feared that a bill based on a customer charge, a demand charge, and a flat energy charge for kwh would result in revenue instability, and contended that basic monthly kwh consumption accounted for in the initial blocks is relatively insensitive to the vagaries of weather.

(b) Louisville Gas and Electric Company

LG&E has implemented flat rates except for a second block in the residential winter tariff. LG&E witness Hart stated: "In today's environment of increasing costs and emphasis on conservation, we believe a flat rate structure more nearly comports with that environment than does a declining block rate structure." 21/ The Commission agrees with LG&E's position concerning declining block rates, and commends the Company for taking the initiative in this regard. Mr. Hart further commented that LG&E's costs do not justify declining block rates since there was no evidence of a decrease in the energy component as consumption increases, nor of improved load factor at higher consumption levels.

20/ Willhite testimony, p. 14.

21/ Hart testimony, p. 4.

(c) Union Light, Heat and Power

ULH&P opposes the adoption of this standard. Witness Van Curen testified that "Declining block rates are an appropriate rate structure to capture fixed customer costs until the customer charge is sufficiently high to cover costs." 22/ The Commission wishes to point out that adequate load research is essential to justify a declining block rate structure.

In spite of its opposition to adoption of the standard, however, ULH&P is in the process of gradually "flattening" its rate structure. Witness Van Curen stated: "In fact, Union Light is working towards a flat rate. We can't do it all at once, but, in our last rate case, we got closer." 23/ The Commission agrees that any fundamental change in rate structure should be implemented gradually.

(d) Kentucky Power Company

Ky. Power witness DeSieno used a strict interpretation of Section 111(d)(2) of PURPA. He testified that:

> [For consumer classes that are billed on a kwh basis there] could be a series of declining blocks, in which the energy cost component of all blocks would be identical, while the customer and demand cost components of the blocks could decrease with increasing consumption level of such blocks. The Company's interpretation of

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22/ Van Curen testimony, p. 7.

23/ T.E., September 1, 1981, p. 28.

the standard is that it refers to the energy cost component of such consumption blocks. 24/

Mr. DeSieno provided illustrative flat rate tariffs for the RS class, which used the embedded cost of service approach. Regarding the implementation of the standard, Mr. DeSieno stated that "the Company proposes to modify its rate structures, as part of its next rate case, so as to reduce, flatten and/or eliminate declining blocks, so that each rate schedule fully complies with the standard." 25/ All of the parties emphasized the principle of gradualism in implementing the standard. The Commission agrees.

(e) Determination

The Commission finds it appropriate to implement the declining block rate standard. A reasonable schedule for implementation will promote the purposes and objectives that the Commission has listed above.

The Commission also finds that a broader interpretation of the declining block standard is desirable. Implementation of the cost of service standard, previously mentioned, would require that a rate track all components of cost -- energy, demand and customer. Therefore, if a company wanted to use a declining block rate structure for either a demand or

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24/ DeSieno testimony, p. 31.

25/ DeSieno testimony, p. 32.

energy charge, it would have to demonstrate that such a structure is cost-justified. Further, if a company's costs do not justify its rate structure, that company would have to move to implement a rate structure that is cost-justified.

The Commission is aware that such a cost-justification would require a considerable amount of stratified load research, most of which is not currently available. In order to remedy this shortcoming, the Commission will require each company to file, within 60 days from the date of this Order, a detailed schedule showing when it intends to conduct such research, the specific information that is sought by the research, and when the results and analysis of this research will be available. This information will then be used to plan the company-specific hearings on the determination of cost-based rate structures. Provisions governing those hearings will be set forth in subsequent Orders of the Commission.

Finally, the Commission notes that the companies, with the exception of LG&E which has already established flat rates except in the second block in the RS tariff, testified that they intend gradually to move away from declining block rates. The Commission emphasizes that if the costs of a company do not justify a declining block rate, implementation of the flat or inverted rates which must replace the

declining block rates should proceed in a manner that will not cause undue financial hardship or dislocation on any customer class.

TIME-OF-DAY RATES

Section 111(d)(3) of PURPA states:

> The rates charged by any electric utility for providing electric service to each class of electric consumers shall be on a time-of-day basis which reflects the costs of providing electric service to such class of electric consumers at different times of the day unless such rates are not cost-effective with respect to such class.

Section 115(b) attempts to clarify the cost-effective criterion by stating that:

> [Time-of-day rates are] cost-effective with respect to each such class if the long-run benefits of such rate to the electric utility and its electric consumers in the class concerned are likely to exceed the metering costs and other costs associated with the use of such rates.

According to the Conference Report, these "other costs" are to be interpreted narrowly, including

> . . .only those costs directly involved in using these rates. . .and not costs indirectly involved such as start-up costs involved in fashioning a time-of-day rate structure for initial consideration in a rate case. 26/

(a) Kentucky Utilities

KU opposed the adoption of time-of-day rates. KU witness Willhite stated that the practical problems which

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26/ Conference Report No. 95-1750, p. 78.

would have to be dealt with to implement time-of-day rates might outweigh any benefits, and he concluded that: "This standard should be adopted as long as all costs and all benefits are evaluated. However, as previously discussed, we believe that the benefits of such rate forms will be relatively small in the near term while the costs are quite high. Therefore adoption at this time is unnecessary." 27/

(b) Louisville Gas and Electric Company

Mr. Hart, LG&E's witness, stated with respect to the time-of-day rate standard that he thinks the Commission "should adopt the standard. My problem is implementation. I would urge the Commission to proceed with caution and, hopefully, we can learn a little more about what the benefits are before we have any broad implementation of the standard." 28/ The Commission agrees with Mr. Hart that a precipitate shift to time-of-day rates is inadvisable. Any change should be gradual. Determining the benefits from time-of-day rates is necessary to evaluate their cost-effectiveness. However, when asked about the Company's plans to study the customer responses to time-of-day rates, witness Hart testified:

27/ Willhite testimony, pps. 21-22.

28/ T.E., September 22, 1981, p. 11.

> The company has decided to focus more on load management techniques, probably, than on the experimentation with time of day rates. 29/

Further:

> The company is concentrating its research on load management because if you actually control a load, you know what you're getting. You don't know. . .how he's [i.e., a customer] going to respond with time-of-day rates. 30/

For purposes in this proceeding, Mr. Hart calculated illustrative time-of-day rates for LG&E's major rate classes. For the residential and general service classes,:

> [T]he illustrative TOD rates were calculated by setting the customer charge at the level proposed. . .and subtracting the revenue from such charge from the total revenue requirement. Rates for the three rating periods were selected which basically tracked embedded costs. 31/

(c) Union Light, Heat and Power

ULH&P opposed adoption of the time-of-day standard. ULH&P witness Van Curen stated that time-of-day rates failed to achieve the objective of inducing customers to switch from peak to off-peak electric consumption. In assessing the benefits and costs of this standard, ULH&P restricted its analysis to residential consumers in the short run. The authors of the report on which ULH&P bases its opposition

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29/ T.E., September 22, 1981, p. 25.

30/ T.E., September 22, 1981, p. 26.

31/ Hart testimony, p. 10.

state: "At the time of this writing, a comprehensive cost/benefit analysis has not been completed. . ." 32/ In addition, ULH&P has ignored industrial and commercial customers in its assessment of the benefits and costs of this standard. Much of the cost envisioned for residential consumers, such as metering, would be inconsequential for industrial and commercial consumers.

ULH&P did not attempt to assess the cost-tracking capability of the time-of-day rate. On cross-examination Mr. Van Curen stated that ULH & P could not assess this factor "because the time-of-day rates that we presented in this experiment were not cost-justified." 33/ The equity purpose was generally ignored as ULH&P focused on the problems consumers would have adjusting their lifestyles to meet constraints imposed by the time-of-day rate.

(d) Kentucky Power Company

With regard to the time-of-day standard most parties to proceeding 203(d) agreed with Ky. Power witness DeSieno's suggestion that:

> The Commission finds this standard appropriate with the proviso that experimentation and gradual implementation be used as necessary to identify

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32/ Van Curen testimony, p. 21, Report on TOD Experiment.

33/ T.E., September 1, 1981, p. 29.

quantitative costs and benefits, and to resolve possible problems. 34/

Ky. Power has already implemented a voluntary experimental time-of-day rate for residential consumers. This experiment will serve as the basis for determining the cost-effectiveness of implementing time-of-day rates for all or a portion of the residential class. The Commission commends Ky. Power for taking the initiative in this important regard. Further, Mr. DeSieno testified that "it is not feasible or appropriate at this time to implement TOD rates extensively throughout" the commercial and industrial classes. 35/ The Commission disagrees with Ky. Power's contention. The Commission believes that it is with regard to the commercial and industrial customers that the cost/benefit equation is likely to be most favorable.

Ky. Power discussed at some length the issue of embedded versus marginal costs as the more appropriate basis for designing time-of-day rates. Witness DeSieno testified that:

> the basic objectives of time of day rates are to provide more accurate price signals to consumers, and to manage load by inducing customers to reduce their demand during the on-peak periods. 36/

34/ DeSieno testimony, p. 35.

35/ DeSieno testimony, p. 36.

36/ DeSieno testimony, p. 34.

Mr. DeSieno expressed his belief that these objectives could be met by basing rates on embedded costs.

(e) Determination

The Commission finds it appropriate to implement the time-of-day rate standard. The record in this proceeding clearly shows that the companies experience daily and hourly variations in their costs, and while there was discussion in this proceeding about the likelihood that time-of-day rates would induce customers to shift some of their consumption from peak to off-peak, the Commission believes that such induced shifting is a secondary consideration. The primary consideration which argues for time-of-day rates is the requirement that a consumer bear the full cost, to the utility, of his consumption pattern.

Thus, the Commission believes implementation of the time-of-day rate standard promotes the equity objective. The Commission also believes that implementation of the standard would promote the conservation and efficiency objectives. While the Commission recognizes the potential conflict with the other objectives -- rate continuity, understandability and company revenue stability -- it believes that this conflict can be minimized through a well-reasoned and gradual method of implementation. The Commission will proceed in this manner.

The Commission notes that several states, including New

York, Wisconsin, and California, have determined that time-of-day rates are cost-effective, at least for large electric consumers. The Commission believes time-of-day rates would be cost-effective for large users in Kentucky also, especially where the necessary meters are in place. Accordingly, the Commission has developed the following schedule of implementation in Kentucky. There are four phases to the proposed plan for implementation.

Phase 1: The companies, in conjunction with the Commission, shall designate industrial and/or commercial consumers who shall be given mandatory time-of-day rates. The Commission recommends that the group be large consumers because, to the extent that some metering capability is already available, implementation for this group will more likely prove cost-effective. Also, the Commission recommends that the companies limit the number of customers so as to better manage the required research.

Phase 2: (A) The companies shall perform one year of extensive load research on the targeted group. This research will be done prior to imposing the time-of-day rate. The resulting baseline data will be essential for evaluating the cost-

effectiveness of implementing the rate.

(B) During the year of performing customer load research, the companies shall engage in a vigorous and aggressive customer education program. This step will be crucial to the customer acceptance and overall viability of the rate structure. Also during this year, the companies should begin designing rates. The Commission recommends that in the initial implementation no customer's bill would increase by more than ten percent over what it would have been without time-of-day rates.

Phase 3: A time-of-day rate for the target group shall then be implemented for one year. The companies shall continue to perform load research on the targeted group.

Phase 4: Following that year, the companies shall prepare a final report for the Commission. This report will provide a cost-benefit analysis by comparing the two years of information gathered from the customers. The cost-effectiveness of the time-of-day rate shall be determined and reported. If the rates are cost-effective, they would be continued for this group and the phased procedures would be begun for another group of customers.

Cooperation between the Commission and the companies is essential for accomplishing the task outlined above. The Commission is of the opinion that this cooperation can best be attained through informal meetings (between company representatives and Commission staff) and believes that a Load Management Task Force should be formed. The Task Force will be composed of Commission staff, utility representatives, and others. The Task Force will meet regularly, and will discuss, analyze, and plan various load management methods; issue progress reports; and serve as a forum to exchange information among the companies and others. These methods shall encompass both the indirect controls of time-of-day and seasonal rates, and the direct controls of interruptible rates and various other load management techniques. The duties of the Task Force will be coordinated through the Commission's Division of Research. A member of this Division will be named coordinator and will serve as the primary link between the Commission and the companies.

SEASONAL RATES

Section 111(d)(4) states:

> The rates charged by an electric utility for providing electric service to each class of electric consumers shall be on a seasonal basis which reflects the costs of providing service to such class of consumers at different seasons of the year to the extent that such costs vary seasonally for such utility.

(a) Kentucky Utilities

KU opposed the adoption of the seasonal standard. Its witness pointed out that KU experiences a relatively level load throughout the year and cannot be designated winter-peaking or summer-peaking, as those peaks have leapfrogged the last several years.

(b) Louisville Gas and Electric Company

LG&E witness Hart recognized the "signficant differential between the summer and winter loads" 37/ LG&E faces and the corresponding low annual load factor. He concluded that: "It is primarily the seasonal characteristics that should be addressed in the consideration of various pricing schemes." 38/ In Case No. 7301, filed December 11, 1978, LG&E proposed and the Commission approved the implementation of seasonal rates. The Commission commends LG&E for this initiative. Mr. Hart also testified that seasonal rates will promote the PURPA purposes and the other Commission purposes, except for the revenue stability objective. Mr. Hart stated that: "It is extremely doubtful that seasonal rates will promote revenue stability since fluctuations in revenue due to weather will be compounded under seasonal pricing." 39/

37/ Hart testimony, p. 6.

38/ Hart testimony, p. 6.

39/ Hart testimony, p. 8.

(c) Union, Light, Heat and Power

All parties to proceeding 203(c) favored the adoption of the seasonal rate standard. ULH&P witness Van Curen stated: "Seasonal rates are a relatively simple and cost-effective way to recognize the higher costs associated with generating greater amounts of electricity in the peak season." 40/ ULH&P has implemented a seasonal rate for its residential customers, for which it is commended, though the Commission is puzzled that the company has not implemented seasonal rates for its distribution and transmission rate customers.

(d) Kentucky Power Company

Ky. Power witness DeSieno stated that: "Seasonal rates are consistent with the conservation, efficiency, and equity purposes of PURPA," and recommended that the Commission find the standard appropriate. 41/ However, with respect to implementation of the standard, Mr. DeSieno testified that: "It was found that AEP System costs do not vary significantly and/or consistently on a seasonal basis and, therefore, it was concluded that seasonal rates are not appropriate for the System at this time." 42/

40/ Van Curen testimony, p. 3.

41/ DeSieno testimony, p. 37.

42/ DeSieno testimony, p. 38.

(e) Determination

The Commission finds it appropriate to adopt the seasonal rate standard. The Commission further finds it appropriate to implement a seasonal variation in rates when costs vary seasonally. When that condition prevails, seasonal rates would promote the PURPA objectives of equity and conservation. Moreover, there is an additional attraction to seasonal rates. They can be implemented at very minimal cost.

The record in this proceeding indicates that seasonal rates may not be cost-justified for either Ky. Power or KU. The lack of seasonal variation in Ky. Power's costs appears to be due to its membership in the American Electric Power System.

For KU, it appears that since neither the winter nor summer peak clearly dominates, and, since scheduled maintenance must be undertaken in the spring and fall, there is little seasonal variation in costs.

The Commission intends to continue monitoring all of the companies' load research and cost of service studies, and to order implementation of seasonal rates if such rates are cost justified.

INTERRUPTIBLE RATES

Section 111(d)(5) states:

> Each electric utility shall offer each industrial and commercial electric consumer an

interruptible rate which reflects the cost of providing interruptible service to the class of which such consumer is a member.

(a) Kentucky Utilities

KU took the position that an interruptible rate should be negotiated between an individual customer and the company, and set forth in a contract between the two, with subsequent ratification by the Commission. KU, therefore, saw no point in adoption of the interruptible rate standard.

(b) Louisville Gas and Electric Company

LG&E witness Hart testified that interruptible rates "can be useful in the pursuit of the PURPA goals of conservation, efficiency and equity" 43/ and further that they "can promote the other purposes enumerated by the Commission." 44/

Mr. Hart provided an illustrative interruptible tariff which "reflects the elimination of that part of the revenue requirement assigned to the peak period demand charge." 45/ However, Mr. Hart stated "that the applicability of such service should be addressed on a case-by-case basis." 46/

(c) Union Light, Heat and Power

ULH&P took no position on the adoption of the interruptible rate standard because of lack of experience with

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43/ Hart testimony, p. 16.

44/ Hart testimony, p. 17.

45/ Hart testimony, p. 15.

46/ Hart testimony, p. 16.

the rate. Company witness Van Curen stated: "The Company will negotiate an interruptible agreement with any customer that has at least one thousand (1,000) kilowatts of interruptible load." 47/ ULH&P contends that a standard tariff is impossible to design because there are too many variables involved.

(d) Kentucky Power Company

Ky. Power witness DeSieno recommended "that the Commission reject as inappropriate for implementation the standard because of its unrealistic scope." 48/ Mr. DeSieno arrived at that conclusion because of his strict interpretation of the PURPA standard that a "cost-based interruptible rate shall be offered to all C & I [commercial and industrial] consumers regardless of how this rate compares to the non-interruptible rate." 49/ Mr. DeSieno further testified that given "the load and operating characteristics of the AEP System, interruptible loads would have to be interrupted very frequently, perhaps during 30% of all week days, and for lengthy periods of time." 50/ Mr. DeSieno stated that Ky. Power would remain "willing to discuss and consider all

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47/ Van Curen testimony, p. 21.

48/ DeSieno testimony, p. 40.

49/ DeSieno testimony, p. 40.

50/ DeSieno testimony, p. 41.

specific requests for interruptible rates under special contract for customers with loads of 20,000 kw or more." 51/

(e) Determination

The Commission finds it appropriate to implement the interruptible rate standard. The Commission believes that implementation of the standard will promote the purposes of PURPA. The Commission also believes that it is not sufficient for a company to state its willingness to negotiate special contracts for interruptible service. The equity objective can be better promoted by requiring each utility to file an interruptible tariff with this Commission in its next rate case. This tariff would serve as the starting point in negotiating a special contract, and deviations from the filed tariff would have to be justified by cost data. Application could be made to the Commission for resolution of substantive issues upon which the company and customer could not agree. Further, the Commission understands the concerns raised by Ky. Power's interpretation of the PURPA standard and finds it reasonable to include a stipulation in the tariff limiting it to customers of some minimum demand, if the company chooses to include such provision and can provide justification therefor.

The Commission recommends that each company establish a goal of a percentage of its load to be served under interruptible

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51/ DeSieno testimony, p. 42.

contracts. Each company shall then make periodic reports to the Load Management Task Force on its efforts to meet its goal.

LOAD MANAGEMENT TECHNIQUES

Section 111(d)(6) states:

> Each electric utility shall offer to its electric consumers such load management techniques as the State regulatory authority has determined will--
>
> (a) be practicable and cost-effective, . . .
>
> (b) be reliable, and
>
> (c) provide useful energy or capacity management advantages to the electric utility.

Section 115(c) states that load management techniques shall be determined "to be cost-effective if"

> (1) such technique is likely to reduce maximum kilowatt demand on the electric utility, and
>
> (2) the long run cost-savings to the utility of such reductions are likely to exceed the long-run costs to the utility associated with implementation of such technique.

(a) Kentucky Utilities

KU recognizes that there are potential capacity savings associated with load management techniques and has designated an in-house committee to deal with the matter. Nevertheless, KU did not recommend adoption of the standard.

(b) Louisville Gas and Electric Company

According to LG&E witness Lyon, LG&E has determined that residential air conditioner controls have the most

potential for their system, and "the Company is now studying the need, and feasibility, of conducting a pilot project to control residential air conditioning via VHF radio." 52/ As described by Mr. Lyon the project would likely begin in the summer of 1983, last two years, and include approximately one hundred single-family residences. The results of the project will serve as the basis for determining the cost-effectiveness of this load management technique. Mr. Lyon mentioned that the cost-effectiveness decision may be expedited by "using the data we are now collecting in our load research program to model residential air-conditioning customers. If we can do this, we may be able to mathematically emulate the actual cycling of their units." 53/

(c) Union Light, Heat and Power

ULH&P took no position on the adoption of the load management rate standard. However, it did state its opinion that the efficiency and conservation purposes of PURPA would be served by load management.

(d) Kentucky Power Company

Ky. Power witness DeSieno testified that: "When properly applied, based on adequate experimentation and analysis, load

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52/ Lyon testimony, p. 21.

53/ Lyon testimony, p. 25.

management techniques can be consistent with the purposes of PURPA. Therefore, the Company recommends that the Commission find this standard appropriate." 54/ He further testified that before proposing rate schedules to cover the various load management techniques, "the Company is studying the cost-effectiveness of the direct control of water heaters, central air conditioners, and central electric furnaces." 55/ The Commission agrees that an evaluation of the cost-effectiveness of these load management techniques should be conducted prior to implementation.

(e) Determination

The Commission finds it appropriate to implement the load management techniques standard. The Commission believes that implementation of this standard will promote the purposes of efficiency and conservation.

The Commission is, however, very interested in determining the cost-effectiveness of the various load management techniques before general implementation commences. Kentucky is fortunate to have pilot projects underway or at least well into the planning stages, such as LG&E's projects and Ky. Power's Test of Energy Sharing Technology program. The Commission will be interested to see if the mathematical

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54/ DeSieno testimony, p. 43.

55/ DeSieno testimony, p. 43.

modelling mentioned by LG&E proves useful in accelerating the evaluation of the cost-effectiveness of the radio controls on residential air conditioners. The Commission is especially hopeful that this project, to be undertaken by LG&E, can be initiated considerably sooner than the summer of 1983.

The Commission believes that the Load Management Task Force will provide an excellent forum for the companies and others to share the experiences and knowledge gained in their research. The information will also flow to the Commission through the Task Force coordinator.

The Commission notes that all of the companies are in some manner evaluating the various load management techniques. The Commission strongly encourages such activity. As the companies complete their evaluations of the various techniques, the Commission looks forward to working with the companies to implement those techniques which are cost-effective.

SUMMARY

The Commission adopts all of the ratemaking standards set forth in section 111 of PURPA. As the Introduction to this Order points out, the nature of the electric industry has changed fundamentally over the past decade or so, and PURPA is a response at the federal level to that fundamental change, and especially to the uneven response to that change

of the principal actors -- electric utilities and state regulatory agencies.

The past decade has demonstrated clearly the need for new ways of doing business in the electric power industry -- ways which are relevant to today's reality, and which replace those methods which were developed during an era now gone. Regardless of how suited those methods might have been to that earlier era, the march of events has rendered them anachronistic, and today they are more likely to be part of the problem than part of the solution.

Solution? It is fatuous to speak of a "solution." The search should be for mitigation -- for measures which ease the burden which today's reality imposes on companies and consumers. The Commission believes the ratemaking standards which it implements are such measures, and it believes that use of a number of those standards by companies regulated by the Commission, prior to any action by the Commission or the ERC, demonstrates that at least some of the companies share that belief.

The Commission recognizes the inevitability of conflict between objectives -- not only the three PURPA objectives of conservation, efficiency, and equity, but also the additional, Commission objectives of rate continuity, revenue stability, and understandability -- and the need for careful, explicit choice between or among objectives which are in conflict.

Finally, the Commission is sensitive to the need to proceed slowly and deliberately in implementing the rate-making standards. But there is a distinction between proceeding slowly and doing nothing, and doing nothing is as indefensible as proceeding impetuously.

IT IS THEREFORE ORDERED that, with respect to KU, LG&E, ULH&P and Ky. Power, in order to carry out the purposes of Title I of the Public Utility Regulatory Policies Act, it is appropriate to implement the following Federal standards: cost of service, decling block rates, time-of-day rates, seasonal rates, interruptible rates and load management techniques.

IT IS FURTHER ORDERED that, with respect to KU, LG&E, ULH&P and Ky. Power, the aforementioned Federal standards shall be implemented all as more fully described herein.

IT IS FURTHER ORDERED that each of the electric utilities, KU, LG&E, ULH&P and Ky. Power, shall file an embedded cost study conforming to this Order for the test year in future rate cases, beginning with the first rate case of each utility filed after the date of this Order.

IT IS FURTHER ORDERED that each of the electric utilities, KU, LG&E, ULH&P and Ky. Power, shall file a marginal cost study conforming to this Order in the second rate case of each utility filed after the date of this Order, and thereafter as ordered by the Commission.

Done at Frankfort, Kentucky, this 28th day of February, 1982.

PUBLIC SERVICE COMMISSION

Chairman

Vice Chairman

Commissioner

ATTEST:

Secretary

IT IS FURTHER ORDERED that within 60 days of the date of this Order, each of the electric utilities, KU, LG&E, ULH&P and Ky. Power, shall file a detailed schedule showing when each utility intends to conduct stratified load research, the specific information that is sought by the research, and when the results and analysis of the research will be available.

IT IS FURTHER ORDERED that a Load Management Task Force, the initial membership of which is listed in Appendix B, shall be formed. Further, that the Task Force shall carry out the purposes of this Order. Further, that interested parties not listed in Appendix B may petition the Commission to join the Task Force. Further, that the Director of the Division of Research or his designee shall be coordinator of the Task Force. Further, that the Task Force shall meet at the Commission's offices in Frankfort, Kentucky, within thirty days of the date of this Order, and thereafter as necessary.

IT IS FURTHER ORDERED that each of the electric utilities, KU, LG&E, ULH&P and Ky. Power, shall file an interruptible tariff in the first rate case of each utility filed after the date of this Order.

Done at Frankfort, Kentucky, this 28th day of February, 1982.

By the Commission

ATTEST:

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Secretary

Appendix A

In this Appendix to its Order in Administrative Case No. 203 the Commission undertakes to present the positions and comments of the various participants in the proceedings. Each PURPA standard and each participating utility is treated individually. Although the comments in this Appendix are by no means exhaustive, the Commission believes they will enable the reader to appreciate the tenor of the positions of the various parties.

I. COST OF SERVICE

Section 111 of PURPA establishes the following federal cost of service standard:

> Rates charged by any electric utility for providing electric service to each class of electric consumers shall be designed, to the maximum extent practicable, to reflect the costs of providing electric service to such class, as determined under Section 115(a).

Section 115(a), in turn, prescribes that

> in undertaking the consideration and making the determination under Section 111. . . the costs of providing electric service to each class of electric consumers shall, to the maximum extent practicable, be determined on the basis of methods prescribed by the state regulatory authority . . . Such methods shall to the maximum extent practicable - (1) permit identification of differences in cost incurrence, for each such class of electric consumers, attributable to daily and seasonal time of use of service and (2) permit identification of differences in cost-incurrence attributable to differences in customer demand, and energy components of cost. In prescribing such methods, such state regulatory authority or nonregulated electric utility shall take into account the extent to which total costs to an electric utility are likely to change if - (a) additional capacity is added to meet peak demand relative to base demand; and (b) additional kilowatt-hours of electric energy are delivered to electric consumers.

Section 111(b) of PURPA sets out the procedural requirements for consideration and determination of the standard. Basically, Section 111(b) says that the state regulatory authority must make its determination in writing after evidentiary hearings participated in by electric utilities, intervenors, and the public. Such hearings have been held in Kentucky and a record of the views of the various parties has been established. There follows a summary of the positions of the four participating electric utilities -- KU, Ky. Power, ULH & P, LG & E -- intervenors, the Commission staff and the public relative to the cost of service standard.

(a) Kentucky Utilities

KU selected a "probability of dispatch" methodology (POD) for its embedded cost of service study. This methodology accurately reflects the KU system operation in that it results in a substantial assignment of the cost of expensive base load units to off-peak periods, as well as to peak periods. Commission staff witness, Dr. Virgil Christian, disagreed with the POD methodology and instead argued for the fuel offset model developed by Robert Rohr because, according to Dr. Christian, its application leads to an allocation of capacity costs among rating periods in a way that reflects duration of load as well as peak load. KU, on the other hand, believed the POD methodology achieved the same allocation of capacity costs in a more accurate manner. The industrial intervenor, Mr. James Honaker, seemed to favor the Company view. The Attorney General's witness, Mr. Ben Johnson, emphasized the arbitrariness of cost allocations even with embedded cost methodologies, and argued the merits of marginal cost studies as an alternative.

The Company marginal cost study followed the same scheme of allocating capacity cost among rating periods as did the embedded cost study. The significant difference in the marginal cost study, however, was the use of the costs of additions to capacity, rather than historical costs of capacity. Witness Honaker for intervenor Kentucky Industrial Utility Customers ("KIUC") held marginal cost studies in low regard generally, though he failed to offer specific criticism of the KU study. Staff witness, Dr. Christian, reiterated his objection to the allocation of capacity costs among rating periods, citing the same reason as in the case of embedded costs.

(b) Louisville Gas and Electric Company

1. Embedded Cost of Service

LG & E hired the consulting services of Ebasco Business Consulting Company to perform its embedded cost of service study. LG & E provided a time-differentiated study which used the base-intermediate-peak (BIP) method. LG & E's witness, John Hart, commented that the Company chose this method because "I was impressed with it. I think that it is appropriate for our system." 1/

To perform its study LG & E first had to develop its load data. Since the Company was not actively engaged in performing this research, it had to develop its best estimates for load data. All parties to this proceeding recognized the nature of the load data and expressed their reservations accordingly.

1/ T.E., April 29, 1981, Vol. 1, p. 13.

The next step was to determine the costing periods. According to James H. Sutherland, an Ebasco consultant testifying for LG & E in determining the costing periods,

> The basic objective is to set conditions which are conducive to discrete load shifts that result in net economic benefits both to consumers and to the utility. 2/

Commission staff witness Charles Buechel noted the subjective nature of determining costing periods this way and stated that he would prefer a more objective method based on grouping periods of similar costs. Attorney General's witness Johnson also noted the subjective determination of costing periods and stated:

> It is apparent that the Companies have not been consistent in determining the distinctions between peak and off-peak electricity usage . . . it is apparent that the methodologies used to determine rating periods are inherently arbitrary, and produce widely varying results. 3/

One of the most important and potentially controversial steps in an embedded cost of service study is the allocation of the production or generation costs. In a time-differentiated study this is a two-step process: Costs must be allocated to the costing periods, and disaggregated among customer classes. The BIP method has a rather simple first step. It identifies generating units as base, intermediate or peaking units, and then allocates one-third of the base units to each costing period, one-half of the intermediate units to each of the peak and intermediate periods, and all of the peaking units to the peak period. The peak period production costs are then allocated to classes based

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2/ Sutherland testimony, Exhibit JHS-1, p. 13.

3/ Johnson testimony, p. 95.

on their contribution to the summer peak. The intermediate production costs are allocated based on class contributions to the winter peak. The base period production costs are allocated based on an average of the classes' non-weather sensitive kwh and total kwh consumed by the class. The kwh allocator in the base period was used in lieu of base period demands which were not available from the estimated load research. Witness Sutherland preferred this method of allocating the production costs to the periods because of the equity notion implied by the fact that "It avoids a 'free ride' for off-peak service." 4/

Witness Johnson noted that much of the production costs are in fact related to kwh consumption and should be allocated to the classes accordingly. He stated:

> A substantial portion of the costs of generating plants should not be allocated on the basis of the coincident system peak demand. Instead, these costs should more logically be allocated on the basis of kwh generation and sales. 5/

Witness Buechel noted the arbitrary allocation of production costs to the periods. He stated: "It is not clear that equity considerations would necessitate arbitrarily assigning exactly one-third of the production cost . . . to each of the rating periods." 6/ Witness Buechel also expressed his preference for an alternative allocation method referred to as the "fuel offset" method which, he contended, is "premised on the same type of

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4/ Sutherland testimony, Exhibit JHS-1, p. 15.

5/ Johnson testimony, pp. 32-33.

6/ Buechel testimony, p. 14.

reasoning that a system planner would use in making his decisions concerning investing in and dispatching the generating units." 7/ The fuel offset method separates the production costs into demand-related and energy-related costs. The demand-related costs would be allocated entirely to the peak period and then allocated to classes based on their contribution to system peak. The energy-related component would be allocated on the basis of a class' kwh usage during the relevant period.

There was disagreement concerning the classification of common cost between demand and customer cost. LG & E used the minimum distribution grid method to separate much of the distribution network into demand and customer components. The minimum distribution grid is a technique approved in the NARUC Cost Allocation Manual. Staff witness Buechel quoted James C. Bonbright's classic work, Principles of Public Utilities Rates, which states: "The inclusion of the costs of a minimum-sized distribution system among the customer-related costs seems to me clearly indefensible" (p. 347). 8/ Witness Buechel further recommended limiting what is included in customer costs.

Attorney General's witness Johnson was very critical of the minimum size method of classifying certain overhead costs as either demand or customer related. He asserted that:

> While it can be argued that these costs do not vary with specific daily fluctuations in kwh sales or kw demand, it is equally true that so-called customer costs do not vary exclusively with the number of cus-

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7/ Buechel testimony, p. 15.

8/ Buechel testimony, p. 13.

> tomers. . . . Since these costs are a function of many variables, it is not particularly logical to classify them as customer costs. Consequently, such an erroneous calculation of customer costs is neither appropriate nor meaningful as a basis for establishing a rate design. 9/

Witness Johnson also suggested some ways to limit the costs that are included as customer costs. His preference is to include only accounts 901, 902, and 903 which results in an average monthly cost for all customer classes of $.80, 10/ whereas LG & E calculated a $3.95 monthly cost for the residential class. 11/

2. Marginal Cost of Service

Ebasco also performed the marginal cost study for LG & E. The study determined long-run marginal cost by using a perturbation technique as required in the Cicchetti, Gillen and Smolensky method. The Trimble County 2 plant, which is a baseload coal plant, was the basis for determining marginal cost. A probability of deficiency program was used to assign marginal cost, both capacity and energy, to each hour. The Company witness on marginal cost, Stephen J. Baron, noted that the study was done primarily to meet the Company's Section 133 requirement of PURPA. Thus, although the results from the study could be used for information purposes and as a tool for rate design, Mr. Baron "wouldn't recommend that the results of this study would be used to . . . produce rates." 12/ Witness Buechel disagreed with LG & E's

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9/ Johnson testimony, p. 59.

10/ Johnson testimony, Exhibit No. (BJ-1) Schedule 6, p. 1 of 3.

11/ Sutherland testimony, Exhibit JHS-1, p. 47.

12/ T.E., April 29, 1981, Vol. 1, p. 114.

application of the method to determine its long-run marginal costs. He stated that the marginal capacity cost had been overstated because LG & E had determined a zero fuel savings from installing Trimble County 2 and because LG & E used a levelized or fixed carrying charge to annualize its marginal capacity cost. He also stated that he believed the marginal energy cost had been understated, and cited, as the basis for this belief, data in the annual report of the Federal Energy Regulatory Commission ("FERC") which show average cost of fuel burned that is greater than the marginal energy cost LG & E reported.

3. Marginal Versus Embedded

Company witness Hart testified that: "It is our recommendation that this Commission reject marginal cost based pricing because of the major problems of definition, determination, and implementation." 13/ In addition he felt that rates based on embedded cost had a "better chance of accomplishing the purposes than if they are based on marginal costs." 14/ A similar position was taken by Mr. Jay B. Kennedy testifying for the intervener, Airco, Inc., who stated that "rates should be based on today's actually incurred costs, correctly apportioned, and not on costs evaluated by confusing and often confused hypothetical distortions of economic theory." 15/

13/ Hart testimony, p. 3.

14/ Hart testimony, p. 16.

15/ Kennedy testimony, p. 13.

Witness Buechel testified that:

> if marginal costs are carefully quantified and rates are structured to approximate these costs, I feel that the three purposes of PURPA as well as the second purpose the Commission has added, protecting the financial integrity of the Company, would all be furthered. 16/

Similarly, Mr. Johnson testified that: "Marginal costs can be quite useful in designing rates. When properly applied, marginal cost analysis can yield a rate design which is economically efficient, equitable and promotive of energy conservation." 17/ Further, he stated "an embedded cost of service study, however, would not have any of these advantages, since it does not include estimates of marginal costs." 18/

(c) Union Light, Heat and Power

1. Load Research

ULH & P has made substantial progress in its load research program, which has been under way since 1975. ULH & P witness, Peter Van Curen, provided a list of the load research projects completed by the Cincinnati Gas & Electric Company ("CG & E") and its subsidiary, ULH & P. ULH & P has completed its research for the relevant customer classes as defined in PURPA Section 133. ULH & P used the load data developed on a consolidated system basis by CG & E and did not use borrowed data in its cost of service studies.

16/ Buechel testimony, p. 18.

17/ Johnson testimony, p. 75.

18/ Johnson testimony, p. 75.

2. Embedded Cost of Service

All parties to proceeding 203(c) favored the adoption of the cost of service standard. ULH & P stated its belief that adoption of the standard would further the three purposes of PURPA, as well as the Commission's additional purposes. Donald Marshall of ULH & P stated in his direct testimony:

> . . . I believe the purposes of PURPA will be served. Rising costs, whether they be attributed to incremental increases in the fuel adjustment or periodic increases in the base charges, convey to the customer a price signal. That price signal encourages the customer to consume less energy not only in the rate of consumption but also in the decision-making process in the consumer's selection of a durable good. 19/

ULH & P purchases all of its electricity from its parent Company, CG & E. The wholesale tariff is subject to the regulation of the FERC. The rates are based on a cost of service study using 12-month coincident peak with an 85 percent ratchet over the 12-month test year. ULH & P system peak occurred on August 8, 1979, for the test year in this proceeding.

Witness Van Curen of CG & E prepared the embedded cost of service study for its subsidiary, ULH & P. The fully allocated cost study was based on the test year 1979. The steps used to develop the cost of service were traditional in that they functionalized, classified, and allocated the cost to serve the various classes of customers. The principle followed throughout was cost causation.

The first issue in time-differentiating a cost of service study is to determine the different costing periods. ULH & P

19/ Marshall testimony, p. 5.

examined incremental and average cost to determine those periods during which the load was the most expensive to serve. These periods were designated peak periods. To clarify and substantiate the time periods further, the Company used a loss of load probability study to determine the hours when it is more likely for the company's load to exceed its capability. According to ULH & P witness Kris Chitkara: ". . . we found that 8 a.m. to 11 p.m. was always a high probability that, on a relative basis, that the load was greater than the system capability available." 20/ All parties accepted the peak/off-peak time periods used by the Company.

The second issue was the demand cost allocation procedure. Witness Van Curen believed that the language of PURPA constrained ULH & P in its choice of allocation methodology. Mr. Van Curen stated ". . . Section 133 of PURPA required us to file on-peak and off-peak cost and you cannot develop on-peak and off-peak cost from the 12CP method." 21/ Given this restriction the Company then allocated the cost to the various time periods using the proportional responsibility method. The proportional responsibility method weights each hour according to use in that hour. Each class' responsibility for the cost of the system then is based on its proportional share of the cost. ULH & P used a peak summer day, peak winter day, and weather neutral day for determining each class' responsibility. Commission witness James Sharpe criticized the use of inadequate sampling of days to determine class use responsibility,

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20/ T.E., May 4, 1981, Vol. 1, p. 81.

21/ T.E., May 4, 1981, Vol. 1, p. 21.

and stated:

> As a demonstration of methodology one cannot object to this procedure, but if the results of the cost of service study were to be used as a basis for ratemaking, a much larger sample of days would be necessary. 22/

In ULH & P's cost of service study the treatment of customer costs was the most controversial part. There are a number of accounts, such as meters, accounting and maintenance, which can be directly allocated to customers. However, there is incomplete agreement on the division of the distribution system between customer costs and demand costs. ULH & P did not perform either a minimum grid study or a zero intercept study to separate these costs properly. Witness Van Curen stated:

> The elements of the cost of service were functionalized as production, transmission, distribution, and allocated to demand, energy, and customer components per the guidelines as set out in the NARUC 'Cost Allocation Manual'. 23/

Staff witness Sharpe pointed out some inconsistencies in the handling of customer costs. In his prefiled testimony Mr. Sharpe stated:

> However, when one examines the Exhibits PVC-2, PVC-3, and PVC-4 on schedule 2 pages 1 and 2 line 12, it can be seen that 100% of the poles, towers and fixtures account has been classified as customer costs. This is contrary to the guidelines in the NARUC manual. 24/

In addition to the criticism leveled at the separation of customer costs, the minimum grid concept was also seriously questioned. Witness Johnson pointed out that if cost causation

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22/ Sharpe testimony, p. 10.

23/ Van Curen testimony, p. 6.

24/ Sharpe testimony, p. 11.

is the guiding principle behind cost of service, many of the accounts included in customer costs do not vary with the number of customers and hence fail the cost causation test. Mr. Johnson stated:

> A. As I explained above, electric utilities incur various overhead costs, such as general operation and maintenance, tax, and depreciation expenses. These are often treated as customer costs, because they are not exclusively a function of demand or energy. However, while it can be argued that these costs do not vary with specific daily fluctuations in KWH sales or KW demand, it is equally true that so-called customer costs do not vary exclusively with the number of customers. In fact, these costs are also generally related to various other factors, such as geographic features, population density, and so forth, as well as KWH usage. Since these costs are a function of many variables, it is not particularly logical to classify them as customer costs. Consequently, such an erroneous calculation of customer costs is neither appropriate nor meaningful as a basis for establishing a rate design.
>
> A portion of these so-called customer costs can be categorized more appropriately as demand and energy costs, while other portions can best be characterized as overhead expenses which are not directly related to any of the three categories of demand, energy, or customers. 25/

3. Marginal Cost of Service

ULH & P filed the CG & E marginal cost of service study. ULH & P's witness, Dr. Kris Chitkara, used the Cicchetti, Gillen and Smolensky methodology for determining marginal cost.

ULH & P used the same method for determining rating periods for the marginal cost study as for the embedded cost of service study. The periods differed slightly in that the embedded on-peak period was from 8 a.m. to 10 p.m. weekdays while the marginal on-peak period was from 8 a.m. to 11 p.m. weekdays.

25/ Johnson testimony, pp. 58-59.

Witness Chitkara explained the differences by stating: "I think 8 a.m. to 11 p.m. on weekdays for the entire year was selected for the Cicchetti methodology earlier than his selection of 8 a.m. to 10 p.m." 26/

ULH & P used the standard Cicchetti procedure of moving plants on the planning horizon either forward or backward one year. ULH & P chose to move four plants forward one year to determine marginal capacity cost. ULH & P provided little explanation of why it chose the particular plants it did and what impact this would have on its marginal capacity cost. In addition, ULH & P provided little explanation on either the assumptions or the internal working of the Cicchetti model. Witness Sharpe observed: "Union Light, Heat and Power provided a marginal cost study without the detailed methodological explanation contained in both Louisville Gas & Electric's and Kentucky Utilities' Marginal Cost Studies." 27/ In this type of hearing these explanations provide insight which cannot be obtained adequately through cross-examination.

4. Marginal Versus Embedded

ULH & P and other witnesses took positions favoring embedded over marginal cost of service studies. ULH & P's witness Marshall alleged that there were a number of potential weaknesses in the marginal cost of service methodologies and cited advantages of embedded costs. Mr. Marshall stated:

> The use of embedded costs on a fully allocated basis is more advantageous than marginal costs for

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26/ T.E., May 4, 1981, Vol. 4, p. 81.

27/ Sharpe testimony, p. 14.

several major reasons. First, the test year concept of matching expenses and revenue requirements remain intact. Second, the time frame upon which embedded costs are determined is well defined eliminating the need for arbitrary guesswork. Third, embedded costs recognize the influence of existing costs; i.e., the date certain existence of plant in service and related expenses are more appropriate in the level of cost determination. Fourth, the embedded cost methodology permits the determination of revenue requirements without further arbitrary adjustments needed to scale down to the authorized statutory level. 28/

The intervenors supported the adoption and use of both marginal cost and embedded cost studies in ratemaking. Dr. William Greene, witness for intervenor Low Income Residents of Northern Kentucky, stated:

> Marginal cost is the means for determining a marginal price. Total revenue can be determined by the traditional procedures completely independent of the marginal cost of service. 29/

Dr. Greene goes on to argue that the most palatable way of introducing marginal cost pricing is maintaining the traditional approach to determining revenue requirements. Witness Johnson recommended that the Commission use marginal cost in the development of rates. Mr. Johnson stated:

> The Commission should require consideration of marginal cost analysis in future rate cases, because the marginal cost concept is so relevant to the generally accepted public policy objectives of rate design. 30/

This requirement was further supported on the basis that cost of service, though not an end in itself, is a tool for assisting the Commission in achieving its objectives. Mr. Sharpe

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28/ Marshall testimony, p. 7.

29/ Greene testimony, p. 9.

30/ Johnson testimony, p. 96.

observed in his direct testimony: ". . . price set below the marginal cost results in wasteful consumption, inefficient use of resources and inequities." 31/ Further, Witness Sharpe stated his belief that prices set at marginal cost would provide the best opportunity for the Commission to achieve its objectives.

There was disagreement between Commission witness and ULH & P witness as to the frequency of filing marginal cost reports. Staff witness Sharpe testified that a marginal cost study should be filed with every rate case, while the company witness preferred a filing every three years, arguing that marginal costs would not change much in that length of time. There was also disagreement as to whether a CG & E consolidated study should be provided instead of a separate ULH & P study. Staff witness proposed that a consolidated report be filed because CG & E plans for the whole system, and thus load growth, whether in CG & E or ULH & P territory, would affect the marginal cost of electricity for all parties. However, ULH & P stressed the jurisdictional separation of the systems and mentioned that the wholesale tariff was subject to FERC's jurisdiction.

(d) Kentucky Power Company

1. Embedded Cost of Service

Ky. Power provided its cost of service studies and testimony through its parent company, American Electric Power Company, Inc. ("AEP"). The embedded cost of service study provided by the Company was a non-time-differentiated study. Ky. Power's witness

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31/ Sharpe testimony, p. 12.

Louis R. Jahn stated: "[T]he company, at this point, is evaluating different means of deriving a time-differentiated study in which we allocate the different time periods." 32/ Commission staff witness, James A. Waddell of Price Waterhouse and Co., testified a time-differentiated study is necessary since "the final test of any cost of service study is whether it accurately reflects the costs that customer classes have imposed on the system. Because the actual cost of providing service varies according to time, an accurate allocation of cost must recognize this fact." 33/

In its study Ky. Power allocated production or generation costs to the classes based on the average of the 12 monthly coincident peak demands to account for scheduled maintenance. 34/ Attorney General's witness Johnson noted Ky. Power "used a single 'allocator', the 12-month average coincident peak demand, " 35/ and stated his belief that "the contribution to system peak methodology results in neither a reasonable allocation of system costs, nor a reasonable distribution of the revenue burden." 36/ Mr. Johnson preferred that kwh generation and sales be considered in allocating generation costs. Staff witness Waddell and witness for Appalachian Research & Defense Fund ("APPALRED"), Dr. John K.

32/ T.E., May 6, 1981, Vol. 1, p. 108.

33/ Waddell testimony, p. 11.

34/ T.E., May 6, 1981, Vol. 1, p. 19.

35/ Johnson testimony, p. 48.

36/ Johnson testimony, p. 36.

Stutz, concurred. Dr. Stutz favored "the use of a methodology which allocates on the basis of both energy and peak responsibility." 37/ Mr. Waddell offered a fuel offset cost of service study, which separated generation costs into demand-related and energy-related components. The demand-related component is then allocated on the basis of demand, while the energy-related component is allocated on the basis of kwh sales in the period. In addition, Mr. Waddell differed with the Company's demand allocator - average of 12 months' coincident peak demands. He used the average of just the January and February contribution to allocate peak demands, since Ky. Power is a winter-peaking company. Witness Waddell stated he did "not think their [Ky. Power's] allocation factor reflects cost causality." 38/

An important and sometimes controversial issue in any cost of service study relates to the separation of certain common costs between demand and customer components. Ky. Power used the minimum system method to make this allocation in the case of distribution costs. The minimum system method is recognized in the NARUC Cost Allocation Manual. However, Witnesses Stutz, Waddell and Johnson were critical of how the Company applied the method. Dr. Stutz stated the method "ignores the effect of customer density on distribution system costs, a factor which existing research has shown is extremely important." 39/ He

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37/ Stutz testimony, p. 9.

38/ Waddell testimony, p. 15.

39/ Stutz testimony, p. 12.

preferred "to allocate all such costs on the basis of demand." 40/ Mr. Waddell was critical of the Company for not crediting the distribution demand allocators for the load carrying capability of the equipment allocated to the customers. He testified that "unless this correction is made, customer loads will be doublecounted in allocating demand-related costs." 41/ With reference to Exhibit JW-5, Mr. Waddell stated that "the minimum size method generally results in a much higher percentage of cost being considered customer-related." 42/ Mr. Johnson argued that many of the customer-related costs the Company derives are not specifically a function of the number of customers and should not be allocated on that basis. He preferred to limit the costs that should be considered as customer costs. If one included only accounts 901, 902, and 903 as Mr. Johnson preferred the average monthly cost for all customer classes would be $1.37. 43/ In contrast, Ky. Power's method yielded a monthly cost of approximately $18.82 per residential customer. 44/

2. Marginal Cost of Service

Ky. Power estimated the "long-run incremental cost of new generating units to be added to the AEP system during the period 1980-1989." 45/ The marginal energy costs were "estimated for

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40/ Stutz testimony, p. 13.

41/ Waddell testimony, p. 18.

42/ Waddell testimony, p. 17.

43/ Johnson testimony, Exhibit 4, p. 1 of 3.

44/ Kentucky Power Company, Section 133 filing, Vol. IV, p. 3.

45/ Jahn testimony, p. 35.

each of the years during the period 1980-1984 using the PROMOD production simulation model . . . PROMOD simulates the future operations of a utility generation system by giving probabilistic treatment to the impact of random forced outages in the calculation of marginal energy costs." 46/ According to Mr. Jahn, PROMOD was chosen because it "utilizes the actual planning process used." 47/

Dr. Stutz also performed a marginal cost of service study using the Cicchetti, Gillen and Smolensky method to determine the marginal cost of new generating units. Dr. Stutz determined that there would be some fuel savings resulting from replacing the older less efficient plants with new capacity. As a result, the marginal capacity cost he calculated is smaller than Ky. Power's marginal capacity cost. Both Ky. Power and Dr. Stutz applied a levelized annual carrying charge to annualize the marginal capacity cost. Witness Stutz used a simulation of the dispatched AEP system for his marginal energy cost. 48/

Mr. Waddell used a lambda/peaker methodology in his marginal cost of service study. This method uses the cost of adding a peaking unit to meet additional load as the basis for the marginal capacity cost. Witness Waddell then used an economic carrying charge to annualize this cost and arrived at an estimate of marginal capacity cost considerably below that of Ky. Power and Dr. Stutz. Mr. Waddell "used the Company reported figures" 49/

46/ Jahn testimony, p. 38.

47/ Jahn testimony, p. 42.

48/ Stutz testimony, p. 22.

49/ Waddell testimony, p. 30.

for marginal energy costs although he believed "that the marginal energy costs reported by AEP understate the appropriate costs." 50/

3. Marginal Versus Embedded

Ky. Power's witness Jahn argued in favor of using embedded or accounting cost for rate design. He believed the "jurisdictional revenue requirements can be allocated accurately to customer classes." 51/ He stated that embedded cost studies used "readily available and fully verifiable costs" 52/ while marginal costs are sensitive to the method chosen. Further, "Average embedded costs are stable over time and . . . marginal costs are subject to wide variations." 53/ The embedded study "interrelates the elements of the cost of service study including costs, customer class load and size characteristics, and system load and operating characteristics." 54/ Witness Jahn also stated that rates based on embedded cost "best reflect current financial responsibilities of the Company," 55/ and also asserted that: "The fully allocated accounting or embedded cost of service study is based on straightforward, easily understood principles, thus providing a sound, manageable and coherent basis for the design of rates." 56/ Mr.

50/ Waddell testimony, p. 31.

51/ Jahn testimony, p. 49.

52/ Jahn testimony, p. 49.

53/ Jahn testimony, p. 50.

54/ Jahn testimony, p. 50.

55/ Jahn testimony, p. 50.

56/ Jahn testimony, p. 50.

Jahn did state, however: "I do not reject the validity of marginal cost pricing as an abstract theory of economics. What I do reject is the concept of partial marginal cost rates" 57/ that result when one reconciles the revenue.

The witness for intervenor Armco, James M. Honaker, also supported embedded costs over marginal costs. He testified that "cost of service based on actualities should be a primary consideration . . . if, on the other hand, a cost of service study is based on extreme or phantom data or applied to a fictional situation" 58/ it has no place in regulation.

Staff witness Waddell recommended that both time-differentiated embedded and marginal cost of service studies be used in the design of rates since "some guidance can be obtained from both studies." 59/ Mr. Waddell noted his concern regarding one of the deficiencies of an embedded study: "A significant amount of costs cannot be allocated by a method based on cost causality." 60/

As described above, Mr. Johnson supported the use of marginal costs for rate design because their use promotes the purposes of PURPA. Dr. Stutz agreed. He testified that marginal costs are superior both "practically and theoretically as a basis for interclass revenue and rate design." 61/ Dr. Stutz stated

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57/ Jahn testimony, p. 42.

58/ Honaker testimony, p. 3.

59/ Waddell testimony, p. 37.

60/ Waddell testimony, p. 20.

61/ Stutz testimony, p. 3.

that in his opinion "marginal costs: (1) are preferable from both a theoretical and a practical viewpoint; (2) advance all of the purposes of PURPA; and (3) address positively the additional concerns raised by" 62/ the Commission. Further, Dr. Stutz noted that "any use of an embedded cost approach requires a variety of assumptions and more or less arbitrary decisions . . . [and] the effects of alternative decisions can be quite significant." 63/

II. DECLINING BLOCK RATES

Section 111(d)(2) of PURPA states:

> The energy component of a rate, or the amount attributable to the energy component in a rate, charged by any electric utility for providing electric service during any period to any class of electric consumers may not decrease as kilowatt-hour consumption by such class increases during such period except to the extent that such utility demonstrates that the costs to such utility of providing electric service to such class which costs are attributable to such energy component decrease as such consumption increases during such period.

(a) Kentucky Utilities

KU did not favor the adoption of the declining block rate standard. According to Mr. Ron Willhite, KU's witness: "Adoption is not necessary because the Company's current rate structure as demonstrated by my testimony contains a flat energy component and fuel clause provision which is also flat. The adoption of a standard without resultant implementation would unnecessarily complicate rate proceedings and impose unjustified additional

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62/ Stutz testimony, p. 30.

63/ Stutz testimony, p. 5.

costs on the Company's customers." 64/ Despite its assertion that the customer is already paying a flat energy charge, KU feared that there would be revenue instability associated with a bill based on a customer charge, a demand charge, and a flat energy charge for kwh, and asserted that basic monthly kwh consumption accounted for in the initial blocks is relatively insensitive to the vagaries of weather.

Commission staff witness, Dr. Christian, was not persuaded that KU's present rate structure reflects a flat energy component, and argued that if the Commission adopts the declining block standard, the burden of proof should fall on KU to show compliance. Witness Christian further suggested that to do that, it would be necessary for KU to show for all blocks in all tariffs that it is possible to back out the customer charge and the demand charge, both coming from the cost of service study, and be left with a remainder that reflects a flat energy charge per kwh. Dr. Christian pointed out that does not seem to be the case with present tariffs, as in the initial blocks of the residential tariff the sum of the demand and customer charges would have to be negative to validate the energy charge per kwh given by the cost of service study. KU witnesses, on the other hand, testified that, under the present tariff, in many instances, the sum of the demand and customer charges in the initial blocks is in fact less than the respective demand and customer costs.

64/ Willhite testimony, p. 14.

Despite the need to eliminate a declining block rate structure not justified by cost, witness Christian maintained that implementation should be gradual to minimize dislocations and to maintain revenue stability for the Company.

The intervenors presented widely different points of view. Mr. Honaker, witness for KIUC, testified that declining block rates are cost justified since they lead to more complete utilization of system capacity through an improved load factor. In fact, witness Honaker stated his belief that a demand charge and an "hours use/KW" energy rate, with the declining block concept applied to KWH/KVA, is the ideal rate since it encourages a more level use of the utility's facilities. However, if that is not acceptable, Mr. Honaker supported declining blocks applied to straight kwh rates since "straight declining blocks - i.e., where kwh are not directly tied to KW of demand - such as most utilities usually offer in at least some of their energy rate schedules are also cost justified on the sound economic principle of scale." 65/ Witness Johnson, on the other hand, believed that the heaviest industrial use is likely to be concentrated around peak hours, at times of high energy cost, and that inverted, rather than declining block rates, are indicated if the desire is to have rates that track costs.

(b) Louisville Gas and Electric Company

LG & E has already implemented flat rates except for a second block in the residential winter tariff. LG & E witness, John

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65/ Honaker testimony, p. 8.

Hart, stated that "in today's environment of increasing costs and emphasis on conservation, we believe a flat rate structure more nearly comports with that environment than does a declining block rate structure." 66/ Mr. Hart further commented that the Company could not cost justify declining block rates since there was no evidence of a decrease in the energy component as consumption increases nor was there any evidence of improved load factor at higher consumption levels.

Commission staff witness, Charles Buechel, agreed with the Company but recommended that the future load research of the Company be monitored to determine if the flat rates now used "do track costs." 67/ Attorney General's witness Johnson also agreed with the Company although he hoped "that the winter residential rate is only an interim step toward a flat rate." 68/ Only witness Ronald V. Willenbrink for intervenor Ashland Oil disagreed with the Company, and he testified that: "There are at least three reasons to justify declining block rates for industrial users such as Ashland Oil." 69/ The reasons given were (1) line losses, (2) distribution system costs, and (3) load factor differences.

(c) Union Light, Heat and Power

ULH & P and Newport Steel opposed the adoption of this standard. ULH & P witness Van Curen stated that: "Declining block rates

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66/ Hart testimony, p. 4.

67/ Buechel testimony, p. 20.

68/ Johnson testimony, p. 103.

69/ Willenbrink testimony, p. 4.

are an appropriate rate structure to capture fixed customer costs until the customer charge is sufficiently high to cover costs. 70/ Witness Honaker endorsed declining block rates because in his view such rates encourage greater use and hence higher load factor consumption.

Witnesses Sharpe and Johnson supported the adoption of the standard. Under the standard, declining block rates could be justified if it is shown that the energy portion of a rate declines with increased consumption. Witnesses Sharpe and Johnson contended that it is the company's responsibility to provide data which justify declining block rates. Adequate load research is essential to justify a declining block, and ULH & P has the load research required for this type of study for most of its rate classes.

ULH & P is in the process of gradually flattening rates. Witness Van Curen stated: "In fact, Union Light is working towards a flat rate. We can't do it all at once, but, in our last rate case, we got closer." 71/

(d) Kentucky Power Company

The interpretation of the declining block rate standard caused some differences among the various parties to proceeding 203(d). Ky. Power's witness Conrad DeSieno used a strict interpretation of Section 111(d)(2) of PURPA. He testified that for consumer classes that are billed on a kwh basis there

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70/ Van Curen testimony, p. 7.

71/ T.E., September 1, 1981, p. 28.

> could be a series of declining blocks, in which the energy cost component of all blocks would be identical, while the customer and demand cost components of the blocks could decrease with increasing consumption level of such blocks. Ky. Power's interpretation of the standard is that it refers to the energy cost component of such consumption blocks. 72/

Attorney General's witness Johnson commented that the Company's interpretation was an "exercise in semantic gymnastics [which] obscures more than it reveals." 73/ Commission staff witness Dr. John Korbel, APPALRED witness Dr. John Stutz, and Attorney General witness Johnson all argued that the consideration of the declining block standard should be broadened to include cost justification for whichever cost component was decreasing. For instance, Dr. Stutz stated that "If rates are to be based on costs in general, then in particular declining block energy rates must be cost-based if they are to continue." 74/ Dr. Stutz explained that: "An adequate development of a cost-based rate structure for customers without time-of-day or demand metering requires the use of detailed stratified load research to properly allocate the demand costs to the various usage levels." 75/ Dr. Stutz elaborated on his position, stating that to cost-justify a declining block rate Ky. Power would have to show "that very small customers have low load factors relative to somewhat larger customers and

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72/ DeSieno testimony, p. 31.

73/ Johnson testimony, p. 91.

74/ Stutz testimony, p. 4.

75/ Stutz testimony, p. 4.

therefore, the demand related and on-peak energy costs should represent a smaller portion of the larger customer's bills." 76/

Witnesses DeSieno and Korbel provided illustrative flat rate tariffs for the RS class. Mr. DeSieno's tariff used the embedded cost of service approach. Dr. Korbel used a marginal cost approach. Mr. Johnson and Dr. Stutz agreed that marginal cost should be the basis for determining rates. Dr. Stutz believed that a "cost of service analysis based on marginal costs will likely result in either flat rates or ascending block rates, with, at most, a very small customer charge." 77/

KIUC witness Honaker and Ashland Oil witness Willenbrink argued that declining block rates are cost-justified. Mr. Honaker argued that: "Declining block rates such as most utilities usually offer in at least some of their energy rate schedules, are cost justified on the sound economic principle of scale." 78/ Mr. Willenbrink argued that considerations of line losses, distribution system costs, and load factor differences would justify declining block rates for industrial users.

Regarding the implementation of the standard, Mr. DeSieno stated that: "The Company proposes to modify its rate structures, as part of its next rate case, so as to reduce, flatten and/or eliminate declining blocks, so that each rate schedule fully complies with the standard." 79/ All of the parties emphasized the principle of gradualism in implementing the standard.

76/ Stutz testimony, p. 6.

77/ Honaker testimony, p. 8.

78/ Honaker testimony, p. 8.

79/ DeSieno testimony, p. 32.

III. TIME-OF-DAY RATES

Section 111(d)(3) of PURPA states:

> The rates charged by any electric utility for providing electric service to each class of electric consumers shall be on a time-of-day basis which reflects the costs of providing electric service to such class of electric consumers at different times of the day unless such rates are not cost-effective with respect to such class.

Section 115(b) further clarifies the cost-effective criterion by stating that the time-of-day rates are:

> cost-effective with respect to each class if the long-run benefits of such rate to the electric utility and its electric consumers in the class concerned are likely to exceed the metering costs and other costs associated with the use of such rates.

According to the Conference Report,

> these other costs [are to] be interpreted narrowly, including only those costs directly involved in using these rates . . . and not costs indirectly involved such as start up costs involved in fashioning a time-of-day rate structure for initial consideration in a rate case. 80/

(a) Kentucky Utilities

KU opposed the adoption of time-of-day rates, and offered several reasons. The Company contended:

1. There would be revenue erosion if the rate were made optional, as only those customers who could conveniently shift to the cheaper rate would make any change.

2. There would be no capacity benefit.

3. There would be little benefit in energy costs as they are almost level round the clock.

80/ Conference Report No. 95-1750, p. 78.

4. Time-of-day rates would distort the relationship between cost of service and revenue requirements among classes if some customers respond to time-of-day rates and others do not.

5. There would be little gain in equity because of implementation problems.

6. It is likely that metering costs, maintenance costs, scheduling problems, and lower system reliability outweigh possible gains.

7. There is no point in adopting the standard because implementation would result in little change in the Company's existing rates.

Commission staff witness, Dr. Christian, did not entirely agree with the Company's point of view. He cited the cost of service study as a basis for arguing that the equity and efficiency objectives of PURPA would be served by a time-of-day by season rate that would be a peak/off-peak rate structure for industrial and commercial customers.

KIUC witness Honaker and Attorney General witness Johnson discussed time-of-day rates in general, and found some merit in them, but neither was specific with respect to KU.

(b) Louisville Gas and Electric Company

Mr. Hart, LG & E's witness, stated with respect to the time-of-day rate standard that he thinks the Commission

> should adopt the standard. My problem is implementation. I would urge the Commission to proceed with caution and, hopefully, we can learn a little more about what the benefits are before we have any broad implementation of the standard. 81/

81/ T.E., September ??, 1981, p.11.

Determining the benefits from time-of-day rates is necessary to evaluate their cost-effectiveness. However, when asked about the Company's plans to study the customer responses to time-of-day rates, Witness Hart testified that: "The company has decided to focus more on load management techniques, probably, than on the experimentation with time-of-day rates." 82/ The Company is concentrating its research on load management because if "you actually control a load, you know what you're getting. You don't know . . . how he's [i.e. the customer] going to respond with time-of-day rates." 83/

For purposes in this proceeding, Mr. Hart calculated illustrative time-of-day rates for the Company's major rate classes. For the residential and general service classes, "the illustrative time-of-day rates were calculated by setting the customer charge at the level proposed . . . and subtracting the revenue from such charge from the total revenue requirement. Rates for the three rating periods were selected which basically tracked" 84/ embedded costs. Commission staff witness Charles Buechel provided another illustrative time-of-day rate for the residential class. In his calculation

> the customer charge is derived from the residual revenue requirement after the marginally priced demand and energy components are deducted from the revenue requirement. . . . [A]ssuming one has good marginal cost information and reliable load data then better price signals are being built into the components with

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82/ T.E., September 22, 1981, p. 25.

83/ T.E., September 22, 1981, p. 26.

84/ Hart testimony, p. 10.

the greatest price sensitivity. Thus, efficiency would be encouraged. 85/

Both Mr. Hart and Mr. Buechel cautioned the Commission not to proceed with the implementation of time-of-day rates until considerably more information, such as demand studies and load research, had been gathered. Attorney General witness Johnson was more positive in his recommendation, and stated his belief "that the Commission should move towards mandatory time-of-day rates for large industrial customers." 86/ However, Mr. Johnson did recommend a cautious and gradual implementation schedule. 87/

(c) Union Light, Heat and Power

ULH & P and Newport Steel opposed adoption of the time-of-day standard. Mr. Van Curen, the company witness, stated that time-of-day rates failed to achieve the objective of inducing customers to switch from peak to off-peak electric consumption. Witness Honaker opposed the adoption of the standard because he believed it was much too broad and tended to place undue hardship on consumers who could not alter their lifestyles.

The Attorney General's witness and Commission staff witness favored adoption of the standard. ULH & P in assessing the benefits and costs of this standard restricted its analysis to residential consumers in the short run. The authors of the report on which ULH & P based its opposition stated: " At the time of this writing, a comprehensive cost/benefit analysis has

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85/ Buechel testimony, p. 17.

86/ Johnson testimony, p. 104.

87/ Johnson testimony, pp. 39-40.

not been completed . . ." 88/ The Company has ignored industrial and commercial customers in its assessment of the benefits and costs of this standard, yet much of the costs envisioned for residential consumers such as metering would be inconsequential for these classes of consumers. Mr. Johnson quite succinctly stated this position in his prefiled testimony: "Even extremely slight variations in usage by the large industrials could produce greater cost savings within the system than the costs of utilizing these sophisticated meters." 89/

ULH & P failed to attempt to assess the cost tracking capability of the time-of-day rates. In cross-examination Mr. Van Curen stated that ULH & P could not assess this factor "because the time-of-day rates that we presented in this experiment were not cost-justified." The equity purpose was generally ignored as ULH & P focused on the problems consumers would have adjusting their lifestyles to meet constraints imposed by the time-of-day rates.

Witnesses Johnson and Sharpe supported gradual implementation of this standard. For the industrial and large commercial consumers, witness Sharpe testified that if there is long run cost-effectiveness mandatory rates should be phased-in with an aggressive education campaign on the benefits of time-of-day rates. For residential and small commercial customers, witness Sharpe

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88/ Van Curen testimony, p. 21, Report on TOD experiment.

89/ Johnson testimony, p. 39.

testified that time-of-day should be offered on an optional basis.

(d) Kentucky Power Company

With regard to the time-of-day standard most parties agreed with Ky. Power witness Conrad DeSieno's suggestion that: "The Commission find this standard appropriate with the proviso that experimentation and gradual implementation be used as necessary to identify quantitative costs and benefits, and to resolve possible problems." 90/ The only party to totally disagree with this statement was the KIUC witness Honaker, who testified that: "This notion set forth in PURPA, in my opinion, is too far-reaching even where the required metering equipment is available. The provision also suffers from vagueness." 91/ The other parties disagreed on the cost basis for establishing the rates and the method of implementation.

Ky. Power has already implemented an experimental time-of-day rate for residential consumers, who can volunteer for the rate. This experiment will serve as the basis for determining the cost-effectiveness of implementing time-of-day rates for all or a portion of the residential class. Further, Mr. DeSieno testified that: "It is not feasible or appropriate at this time to implement time-of-day rates extensively throughout" 92/ the commercial and industrial classes.

90/ DeSieno testimony, p. 35.

91/ Honaker testimony, p. 36.

92/ DeSieno testimony, p. 36.

APPALRED witness Dr. John Stutz bemoaned the fact that "the Company has not offered similar experimental rates to its larger customers." 93/ Both staff witness Korbel and Attorney General witness Johnson went one step further and recommended a mandatory time-of-day rate for large industrial consumers. Mr. Johnson proposed a list of activities to implement such a mandatory rate. 94/ Dr. Korbel stated that: "Time-of-day rates have been in effect elsewhere for over a decade and have been considered cost-effective. There is little to be gained from further experimentation." 95/

The other area of disagreement centered on embedded versus marginal cost as the basis for designing time-of-day rates. Mr. DeSieno testified that: "The basic objectives of time-of-day rates are to provide more accurate price signals to consumers, and to manage load by inducing customers to reduce their demand during the on-peak periods." 96/ Mr. DeSieno believed these objectives could be met by basing rates on embedded costs. Dr. Korbel testified that: "Time-of-day rates that reflect time-differentiated marginal energy and capacity costs provide the correct price signals and further enhance efficiency objectives." 97/ Dr. Stutz also recommended that the "Company be directed to develop marginal

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93/ Stutz testimony, p. 8.

94/ Johnson testimony, pp. 39-40.

95/ Korbel testimony, p. 24.

96/ DeSieno testimony, p. 34.

97/ Korbel testimony, p. 23.

cost based time-of-day rates." 98/ Mr. Johnson stated that "time-of-day pricing can actually be thought of as simply a special case of marginal cost pricing." 99/

IV. SEASONAL RATES

Section 111(d)(4) states:

> The rates charged by an electric utility for providing electric service to each class of electric consumers shall be on a seasonal basis which reflects the costs of providing service to such class of consumers at different seasons of the year to the extent that such costs vary seasonally for such utility.

(a) Kentucky Utilities

KU opposed the adoption of the seasonal rate standard. The Company witness pointed out that the Company experiences a relatively level load throughout the year: it cannot be designated a winter peaker or a summer peaker as those peaks have leapfrogged the last several years.

Commission staff witness, Dr. Christian, favored a time-of-day by season rate, which in reality reduces to a peak/off-peak rate, because he believed that rate more adequately tracks costs.

Mr. Honaker, witness for KIUC, had no objection to seasonal rates per se, which, he intimated, might further the PURPA objectives. "The seasonal rate structure can be a substitute for off-peak rates among small users" - presumably as a reward for off-peak use in accordance with the equity objective, and "there is merit to a rate which would restrain usage in the summer months for some utilities", which serves the efficiency objective by pro-

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98/ Stutz testimony, p. 8.

99/ Johnson testimony, p. 26.

tecting reserve margins and restraining slightly the need for additional capacity, as well as cutting energy use at times of high system lambdas. 100/ However, witness Honaker made no specific recommendations with regard to seasonal rates for KU.

(b) Louisville Gas and Electric Company

Attorney General witness Johnson testified that: "The appropriateness of implementing seasonal rates should be determined on a utility-by-utility basis." 101/ Company witness Hart recognized the "signficant differential between the summer and winter loads" 102/ LG & E faces and the corresponding low annual load factor. He concluded that: "It is primarily the seasonal characteristics that should be addressed in the consideration of various pricing schemes." 103/ Accordingly, LG & E in its two previous rate cases has already implemented seasonal rates. Mr. Hart also testified that seasonal rates will promote the PURPA purposes and the other Commission purposes, except for the revenue stability objective. Mr. Hart stated that: "It is extremely doubtful that seasonal rates will promote revenue stability since fluctuations in revenue due to weather will be compounded under seasonal pricing." 104/

100/ Honaker testimony, pp. 10-11.

101/ Johnson testimony, p. 52.

102/ Hart testimony, p. 6.

103/ Hart testimony, p. 6.

104/ Hart testimony, p. 8.

(c) Union Light, Heat and Power

All parties to proceeding 203(c) favored the adoption of the seasonal rate standard. Mr. Van Curen stated: "Seasonal rates are a relatively simple and cost-effective way to recognize the higher costs associated with generating greater amounts of electricity in the peak season." 105/

ULH & P has implemented a seasonal rate for its residential customers, and witness Johnson stated his belief that such rates should be extended to all customers. He stated: ". . . [I]f generating costs vary by season, they vary by season for all customer classes, not only the residential class." 106/ He suggested that the Commission consider initiating these rates for the other customer classes.

(c) Kentucky Power Company

Ky. Power witness DeSieno stated that: "Seasonal rates are consistent with the conservation, efficiency, and equity purposes of PURPA" and recommended that the Commission find the standard appropriate. 107/ However, with respect to implementation of the standard, Mr. DeSieno testified that: "It was found that AEP System costs do not vary significantly and/or consistently on a seasonal basis and, therefore, it was concluded that seasonal rates are not appropriate for the System at this time." 108/ All

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105/ Van Curen testimony, p. 3.

106/ Johnson testimony, p. 87.

107/ DeSieno testimony, p. 37.

108/ DeSieno testimony, p. 38.

of the other witnesses to proceeding 203(d) agreed. Commission staff witness Korbel stated that "cost-based seasonal rates are desirable but that the AEP system does not exhibit a pronounced seasonal variation in costs. Neither average nor marginal energy costs show a strong seasonal pattern." 109/ KIUC witness Honaker believed "there is merit to a rate which would restrain usage in the summer months for some utilities but not all. Each utility has its own load demand characteristics to accommodate." 110/ Attorney General witness Johnson believed that: "Given the large size of the AEP system and the broad geographic region it covers, it would not be surprising for the degree of seasonality to be relatively low." 111/ APPALRED witness Stutz agreed "with the Company that there is no evidence which indicates a large difference in seasonal energy costs. I do recommend that this situation be periodically reviewed." 112/

V. INTERRUPTIBLE RATES

Section 111(d)(5) states:

> Each electric utility shall offer each industrial and commercial electric consumer an interruptible rate which reflects the cost of providing interruptible service to the class of which such consumer is a member.

(a) Kentucky Utilities

KU took the position that an interruptible rate should be negotiated between an individual customer and the company, and

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109/ Korbel testimony, p. 30.

110/ Honaker testimony, p. 10.

111/ Johnson testimony, p. 94.

112/ Stutz testimony, p. 8.

finalized by contract between the two, with subsequent ratification by the Commission. KU, therefore, saw no point in adoption of the interruptible rate standard. Commission witness James Waddell, of Price Waterhouse, offered a different point of view, contending that there is the possibility of considerable capacity savings if high demand customers can be persuaded to accept the rate. Those savings should be fully reflected in the credit supported by witness Waddell. He also advocated use of a tariff so as to avoid duplication of effort in special contract negotiations.

(b) Louisville Gas and Electric Company

Company witness John Hart testified that interruptible rates "can be useful in the pursuit of the PURPA goals of conservation, efficiency and equity" 113/ and further that they "can promote the other purposes enumerated by the Commission." 114/ Commission witness Waddell and Attorney General witness Johnson agreed.

Mr. Hart provided an illustrative interruptible tariff which "reflects the elimination of that part of the revenue requirement assigned to the peak period demand charge." 115/ However, Mr. Hart opined "that the applicability of such service should be addressed on a case-by-case basis." 116/ Mr. Waddell also provided an illustrative interruptible tariff. His tariff used the marginal cost of generation, transmission and energy as the basis to determine

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113/ Hart testimony, p. 16.

114/ Hart testimony, p. 17.

115/ Hart testimony, p. 15.

116/ Hart testimony, p. 16.

the cost savings from an interruptible load. Both Mr. Waddell and Mr. Johnson recommended the submission of an actual tariff since this would promote the equity objective of PURPA. This tariff would form the basis for negotiating a contract with LG & E.

Mr. Johnson was more specific in his recommendation to the Commission. He recommended

> that the Commission adopt the PURPA standard for interruptible rates, and require the Companies to file proposed tariffs within six months from the date of the Commission's order in this proceeding. Furthermore, the Companies' tariff filings should be accompanied by supportive studies, which indicate the cost savings to be realized by offering interruptible rates to the commercial and industrial classes, as well as communications costs required to implement such rates. The interruptible rates should be at levels which reflect the companies' cost savings net of the communication costs involved. 117/

(c) Union Light, Heat and Power

ULH & P took no position on the adoption of the interruptible rate standard because of the lack of experience with the rate. Witness Van Curen stated: "The Company will negotiate an interruptible agreement with any customer that has at least one thousand (1,000) kilowatts of interruptible load." 118/ ULH & P contends that a standard tariff is impossible to design because there are too many variables involved.

Commission staff witness Waddell supported the adoption of the interruptible rate standard because it will advance the purposes of PURPA. Mr. Waddell in his testimony indicated how the purposes would be served when he stated: "The temporary suspension

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117/ Johnson testimony, p. 68.

118/ Van Curen testimony, p. 21.

of service allows the utility to avoid the costs of additional capacity, in the form of either additional generating units or purchased power, and to avoid the high energy costs faced during peak and emergency periods." 119/

Witnesses Waddell and Johnson recommended that ULH & P file a fixed tariff. Mr. Johnson recommended that the Commission "require the companies to file proposed tariffs within six months from the date of the Commission's order in this proceeding." 120/ Witnesses Waddell and Johnson stated they would base the tariff on the avoided cost as determined under a marginal cost study.

(d) Kentucky Power Company

Ky. Power witness Conrad DeSieno recommended "that the Commission reject as inappropriate for implementation the standard because of its unrealistic scope." 121/ Mr. DeSieno arrived at this conclusion because of his strict interpretation of the PURPA standard that a "cost-based interruptible rate shall be offered to all C & I (commercial and industrial) consumers regardless of how this rate compares to the non-interruptible rate." 122/ Mr. DeSieno further testified that given "the load and operating characteristics of the AEP System, interruptible loads would have to be interrupted very frequently, perhaps during 30% of all week days, and for lengthy periods of time." 123/ Mr. DeSieno stated

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119/ Waddell testimony, pp. 11-12.

120/ Johnson testimony, p. 68.

121/ DeSieno testimony, p. 40.

122/ DeSieno testimony, p. 40.

123/ DeSieno testimony, p. 41.

that Ky. Power would remain "willing to discuss and consider all specific requests for interruptible rates under special contract for customers with loads of 20,000 kw or more." 124/

APPALRED witness John Stutz disagreed with the Company. He felt "that the requirements for frequent and lengthy interruptions could be spread over a number of customers. Thus in implementing this standard we would urge the Commission to press the Company toward a more flexible approach." 125/

Commission staff witness Dr. John Korbel agreed with the Company that the interruptible tariff may not be cost-justified on the AEP System. However, he concluded that "a time-of-use rate is more appropriate." 126/

VI. LOAD MANAGEMENT TECHNIQUES

Section 111(d)(6) states:

> Each electric utility shall offer to its electric consumers such load management techniques as the State regulatory authority has determined will -
>
> (a) be practicable and cost-effective, . . .
> (b) be reliable, and
> (c) provide useful energy or capacity management advantages to the electric utility.

Section 115(c) states:

> that load management techniques shall be determined to be cost-effective if -
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> (1) such technique is likely to reduce maximum kilowatt demand on the electric utility, and
> (2) the long run cost-savings to the utility of such reductions are likely to exceed

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124/ DeSieno testimony, p. 42.

125/ Stutz testimony, p. 9.

126/ Korbel testimony, p. 35.

the long-run costs to the utility associated with implementation of such technique.

(a) Kentucky Utilities

KU recognized that there are potential capacity savings associated with load management techniques, and a committee has been designated within the Company to deal with the matter. KU did not recommend adoption of the standard at this time, presumably because they believed any recommendation should follow the cost-benefit analysis by their committee.

(b) Louisville Gas and Electric Company

The Attorney General witness, Ben Johnson, stated that the companies "should consider further study of various load control alternatives, to determine their cost-effectiveness and the level of customer acceptance." 127/ According to Company witness Robert Lyon the Company has determined that residential air conditioner controls have the most potential for their system. "Therefore, the Company is now studying the need, and feasibility, of conducting a pilot project to control residential air conditioning via VHF radio." 128/ As described by Lyon the project would likely begin in the summer of 1983, last 2 years, and include approximately 100 single-family residences. The results of the project will serve as the basis for determining the cost-effectiveness of this load management technique. Mr. Lyon mentioned that the cost-effectiveness decision may be expedited by "using the data we are now collecting in our load research program to model residential

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127/ Johnson testimony, p. 78.

128/ Lyon testimony, p. 21.

air-conditioning customers. If we can do this, we may be able to mathematically emulate the actual cycling of their units." 129/

(c) Union Light, Heat and Power

ULH & P took no position on the adoption of a load management rate standard. However, the ULH & P opinion was that the efficiency and conservation purposes of PURPA would be served by load management. Witness Van Curen stated: ". . . the primary purpose of load management is to reduce demands at peak period." 130/ Commission staff witness Waddell supported the adoption of the standard for essentially the same reason with the caveat that particular programs may not be useful for all companies.

Witness Waddell proposed a test period before implementation, during which the utility would perform additional studies to determine what technologies offer the greatest benefits. Mr. Waddell stated that the assessment of the savings available from load management should be based on the marginal cost of generation and transmission, and that studies should be filed with the Commission.

(d) Kentucky Power Company

Company witness Conrad DeSieno testified that: "When properly applied, based on adequate experimentation and analysis, load management techniques can be consistent with the purposes of PURPA. Therefore, the Company recommends that the Commission find this standard appropriate." 131/ However before proposing rate schedules

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129/ Lyon testimony, p. 25.

130/ Van Curen testimony, p. 6.

131/ DeSieno testimony, p. 43.

to cover the various load management techniques, "the Company is studying the cost-effectiveness of the direct control of water heaters, central air conditioners, and central electric furnaces." 132/ All of the witnesses agreed that an evaluation of the cost-effectiveness of these load management techniques should be conducted prior to implementation.

132/ DeSieno testimony, p. 43.

Appendix B

Load Management Task Force

(initial membership)

Mr. Forest M. Skaggs*, Coordinator

Mr. William B. Bechanan*, President, Kentucky Utilities Company

Mr. Robert L. Royer*, President, Louisville Gas and Electric Company

Mr. William H. Dickhoner*, President, Cincinnati Gas and Electric Company

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